Vol. 1232 Number 3

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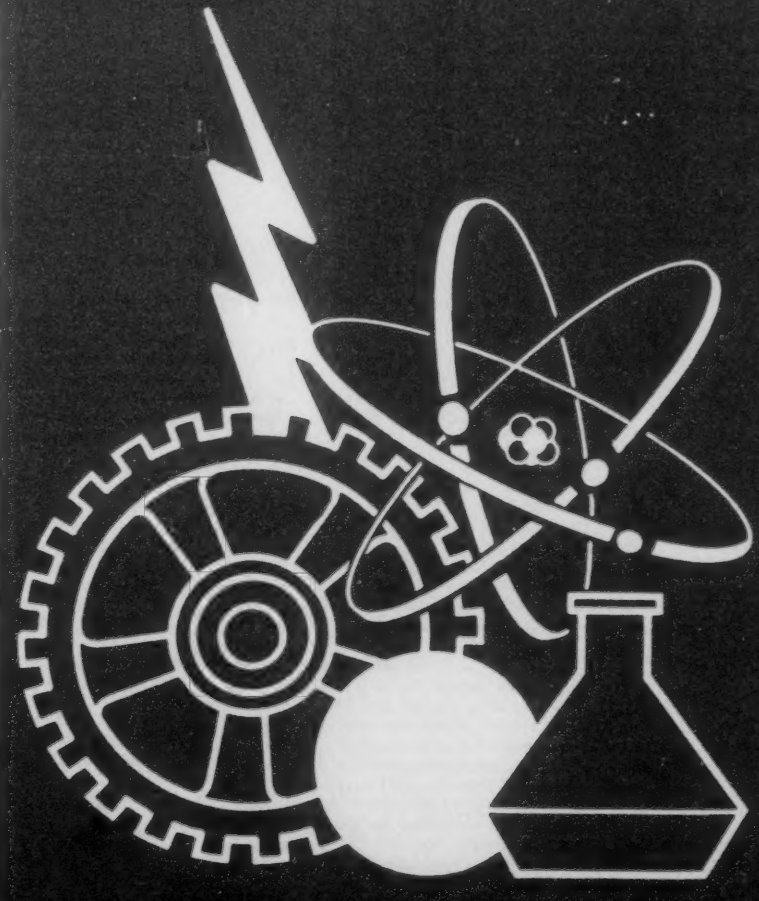
PATENTS

March 21, 2000
Book 2 of 2 Books



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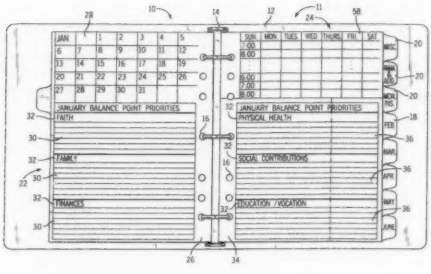
opposed surfaces being secured to each other when said second panel is folded over onto said first panel.

6,039,355

DAILY PLANNING CALENDAR

David V. Durand, S60 W24200 Red Wing Dr., Waukesha, Wis. 53186

Filed May 17, 1999, Appl. No. 312,881
Int. Cl.[7] B42D *5/04*
U.S. Cl. 283—2 **16 Claims**



1. A daily planning calendar including a plurality of individual pages retained within a binder, the calendar comprising:

a plurality of monthly planning pages each representing a month of the year, each monthly planning page including a plurality of monthly information zones and a calendar portion including a visual representation of the current month;

a plurality of daily planning pages each representing a day of the year, each daily planning page having a reduced height relative to the monthly planning pages, such that when the daily planning pages are positioned on top of the monthly planning pages, the calendar portion of the monthly planning page is visible; and

a plurality of weekly planning pages each representing the last day of a week, each weekly planning page including a daily planning portion and a weekly summary portion, the weekly summary portion being detachable from the daily planning portion and including a visual representation of the current week, wherein when the weekly summary portion is detached, the daily planning portion has a height equal to the reduced height of the daily planning pages.

6,039,356

PRINTED SHEET PRODUCTS

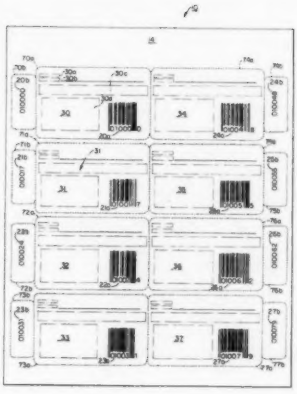
Richard O. Warther, West Chester, and C. Raymond Steen, Jr., Chester Springs, both of Pa., assignors to Vanguard Identification Systems, Inc., Exton, Pa.

Continuation of application No. 08/482,634, Jun. 7, 1995, Pat. No. 5,769,457, which is a continuation-in-part of application No. 08/191,975, Feb. 4, 1994, Pat. No. 5,495,981, which is a continuation-in-part of application No. 07/628,236, Dec. 17, 1990, abandoned, which is a continuation-in-part of application No. 07/502,005, Mar. 30, 1990, Pat. No. 4,978,146. This application Jun. 22, 1998, Appl. No. 102,423.
Int. Cl.[7] B42D *15/00*
U.S. Cl. 283—61 **28 Claims**

1. A printed sheet product comprising:

a thin flexible core formed by a printable material having first and second opposing major planar sides;

a set of at least two separate code fields printed on a first major planar side of the core, each code field of the set being printed with a unique numeric code common to all code fields of the set, the unique numeric code being printed in at least a bar code format in at least a first printed code field of the set and



being printed in at least a second printed code field of the set spaced apart from the first printed code field;

at least one printed field on the second major planar side of the core;

a first cover sheet permanently fixed to the first major planar side of the core overlying at least the first printed code field of the set, the first cover sheet being sufficiently transparent to permit the unique numeric code printed in bar code format in the underlying first code field to be machine read through the first cover sheet;

a pressure sensitive adhesive applied over the second side of the core directly opposite only the second of the first and second code fields; and

scoring extending sufficiently through the core and at least the first cover sheet where present to define at least two separate elements removable from a remainder of the printed sheet product, a first removable element bearing the first printed code field of the set and at least part of the first cover sheet to form a transaction element and a second removable element bearing the second printed code field of the set and at least part of the adhesive, the adhesive on the second removable element being exposable at least after the second removable element is removed from a remainder of the printed sheet product to form a self-adhering label bearing at least the second printed code field.

6,039,357

SECURITY BANDS TO PREVENT COUNTERFEITING WITH COLOR COPIES

Jimmy Ray Kendrick, Nacogdoches, Tex., assignor to Moore North America, Inc., Grand Island, N.Y.

Filed Jan. 8, 1992, Appl. No. 817,894
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B42D *15/00*
U.S. Cl. 283—93 **12 Claims**

1. A protected document comprising:

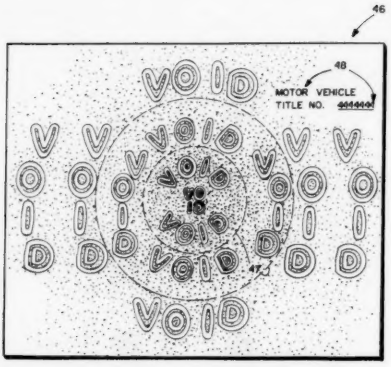
a substrate having a surface;

at least three discrete halftone printed bands disposed on said surface and provided by geometric elements, and in sequence;

each of said printed bands having a significantly different screen density than proximate bands;

within each band said geometric elements comprising a warning word or symbol, and a background;

within each band, one of said warning word or symbol and background having geometric elements of a size such that they are readily reproduced by a photocopy machine, while the other of said warning word or symbol and background has geometric elements of a size such that they are not readily reproduced by a photocopy machine; and



interband areas having densities gradually transitioning between the densities of adjacent bands.

6,039,358

CONNECTING MEANS FOR TWO MEMBERS IN FLUID CONDUCTING ASSEMBLY

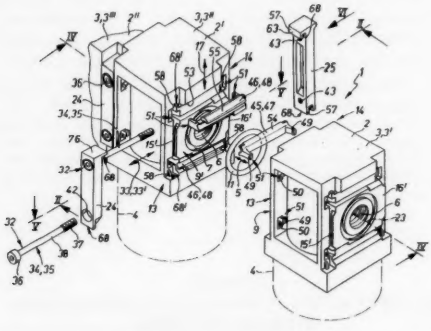
Kurt Stoll, Esslingen; Rolf Berger, Wolfschlugen, and Günter Gebauer, Esslingen, all of Germany, assignors to Festo AG & Co., Esslingen, Germany

Filed Feb. 11, 1998, Appl. No. 22,107

Claims priority, application German Dem. Rep., Feb. 26, 1997, 197 07 630

Int. Cl.[7] **F16L** *19/02*

U.S. Cl. 285—23 **30 Claims**



1. A connection device for connecting two parts in a fluid conducting assembly, comprising holding portions located on sides opposite to one another athwart the direction of connection of the two parts, said holding portions being associated with each other in pairs when said parts are connected together, and a first and a second connecting member adapted to be mounted on the pairs of associated holding portions in a connecting position, said connecting members being able to be clamped by a clamping means in a clamping direction, which is athwart the said direction of connection, against the respectively associated pairs of holding portions in order to cause the parts to be clamped together at facing joint faces thereof, wherein coupling means are provided on the two parts on their facing joint faces, which, prior to the application of the connecting members, provide a coupling of the parts in such a manner that the parts may be slid in the direction of clamping in relation to one another and simultaneously interlockingly fitted together in the direction of connection such that the parts are prevented from separating in the direction of connection, and wherein a first holding and securing means is provided on at least the first connecting member and a second holding and securing means is provided on at least the side of the part facing the first holding and securing means, the first and second holding and securing means cooperating with one another in such a manner that the first connecting member is held, even prior to actuation of the clamping means, on the parts and simultaneously prevents a relative displacement between the two parts.

6,039,359

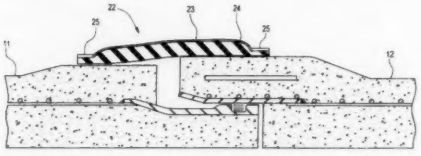
PROTECTIVE SLEEVE AND RELATED METHOD FOR PROTECTING A BURIED PIPE JOINT

Frank P. Valenziano, Warren, N.J., assignor to Coreflex LLC, Asbury Park, N.J.

Filed Feb. 23, 1998, Appl. No. 28,166

Int. Cl.[7] **F16J** *15/10;* **F16L** *55/175*

U.S. Cl. 285—45 **2 Claims**



1. A pipe joint construction comprising in combination:

a tubular concrete first pipe section having an annular front end and provided with a tubular steel spigot projecting forwardly from the front end, the spigot terminating in a leading end and forming an annular ring groove spaced rearwardly from the leading end,

a resilient gasket positioned in the ring groove,

a tubular concrete second pipe section having an annular rear end and provided with a steel bell projecting rearwardly from the rear end and having an inside annular face,

the spigot inserted into the bell in end-to-end relationship with the gasket compressed in the ring groove by the inside annular face,

a sleeve made of a polyurethane foam material having an inorganic alkaline releasing material dispersed therein, the alkaline releasing material being reactive with water to hydrate thereby forming an alkaline substance to protect exposed steel,

the sleeve having a moisture impervious outward surface and a moisture pervious inward surface,

the sleeve spanning from the first pipe section to the second pipe section sealing outwardly a joint formed therebetween, the sleeve extending annularly about the joint and over end margins of both of said pipe sections to protect embedded steel in the margins from corrosion due to surface cracks, and

each of said outer margins connected to the sleeve by means of a tightening band.

6,039,360

COUPLINGS FOR FLUID CONTROLLERS

Tadahiro Ohmi, 2-1-17-301, Komegafukuro, Aoba-ku, Sendai, Miyagi; Michio Yamaji, Osaka; Tsutomu Shinohara, Osaka; Shigeru Itoi, Osaka; Keiji Hirao, Osaka; Yuji Kawano, Osaka; Shigeaki Tanaka, Osaka; Kosuke Yokoyama, Osaka; Hiroshi Morokoshi, Osaka, and Nobukazu Ikeda, Osaka, all of Japan, assignors to Tadahiro Ohmi, Sendai, and Fujikin Incorporated, Osaka, both of Japan

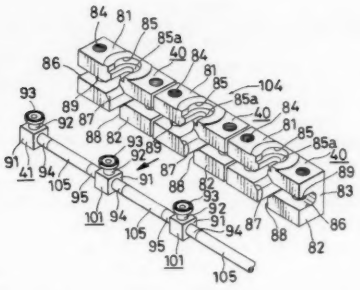
Filed May 6, 1998, Appl. No. 73,387

Claims priority, application Japan, May 8, 1997, 9-117702

Int. Cl.[7] **F16L** *3/26*

U.S. Cl. 285—61 **6 Claims**

1. A coupling for a fluid controller, the coupling being attachable to an opening portion of a downward channel of the fluid controller, the coupling comprising a holding member having an upper wall, a lower wall and a connecting wall and a tubular channel



member held by the holding member, the channel member having an upper end inserted in a through bore formed in the upper wall of the holding member to communicate with the downward channel of the fluid controller, the upper wall of the holding member being formed with screw bores for use in attaching the holding member to the fluid controller.

6,039,361

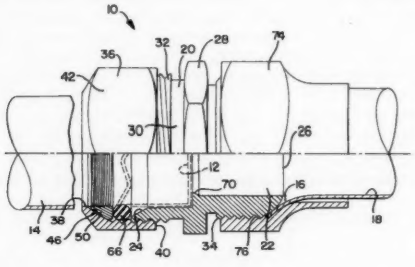
PLUMBING COMPRESSION FITTING FOR CONNECTING ENDS OF PIPE

Oswald P. J. Meli, Solihull, United Kingdom, assignor to MWM Distributors, West Midlands, United Kingdom

Filed Jan. 21, 1998, Appl. No. 10,052

Int. Cl.[7] F16L *55/00*

U.S. Cl. 285—148.19 **8 Claims**



1. A plumbing compression fitting for use in coupling a first pipe end of a first pipe to an opposing end of a second pipe, comprising:

a coupling housing defining a flow passage therethrough, and having a first pipe securing end for engaging the first end of the first pipe, and a second pipe securing end for engaging the end of the second pipe, said flow passage dimensioned to accommodate the ends of the pipes and having a first cross-sectional area;

a capture nut having an axial opening in communication with said passageway and dimensioned to accommodate the first pipe, said capture nut defining an angled annular seat and being configured to threadably engage said first pipe securing end of said coupling housing;

a grab ring dimensioned to be received in said capture nut, said grab ring having a circumference, an inner grab surface dimensioned to circumscribe the first pipe, an inclined radiused outer surface disposed to engage said angled seat, and a front surface, said grab ring defining a gap in said circumference which narrows as said capture nut is tightened upon said first pipe securing end to compressively retain the first pipe in said housing;

an O-ring dimensioned to fit between said first pipe securing end of said coupling housing and said front surface of said grab ring to provide a water tight seal between the pipe and said coupling housing;

said inclined radiused outer surface of said grab ring defining a camming surface which, when engaged by said angled seat, is subject to a force generally perpendicular to said seat, so that as said capture nut is tightened upon said first pipe securing end, said grab ring will be totally retained within said capture nut and will simultaneously move toward to engage compress said O-ring against said first pipe securing end and also tighten about the first pipe such that said grab ring remains free of engagement with said first pipe securing end.

6,039,362

CAM-OPERATED SINGLE ACTING HATCH COVER LOCK

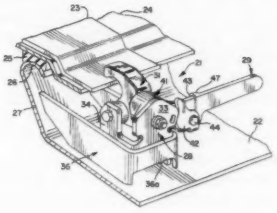
Rudolph E. Nadherny, Golden, Mo., assignor to Ireco, Inc., Chicago, Ill.

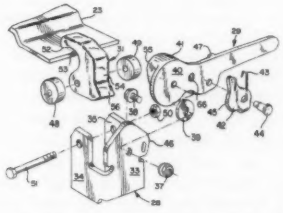
Continuation-in-part of application No. 08/794,847, Feb. 4, 1997, Pat. No. 5,785,362. This application Jul. 27, 1998, Appl. No. 122,929.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B61D *39/00;* **E05C** *3/30*

U.S. Cl. 292—197 **17 Claims**





1. A cam-operated hatch cover lock for securing an openable roof member of a railway hopper car, the hatch cover lock comprising:

a housing member, said housing member being adapted to secure the hatch cover lock to a railway hopper car at a location therealong;

a handle member pivotally mounted to the housing member to pivot about a handle member axis, said handle member having a camming surface; and

a keeper member pivotally mounted to the housing member to pivot about an axis perpendicular to the handle member axis, a cam follower surface of the keeper member, said keeper member being adapted to retain a strapping associated with the openable roof member upon camming engagement of its said cam follower surface by said camming surface of the handle member.

6,039,363

DOOR LOCKING HANDLE ASSEMBLY OF PULL-OUT AND SIDE-SWINGING LEVER-ACTION TYPE

Atsurou Sugimura, and Yoshihide Tuno, both of Tokyo, Japan, assignors to Takigen Manufacturing Co. Ltd., Tokyo, Japan

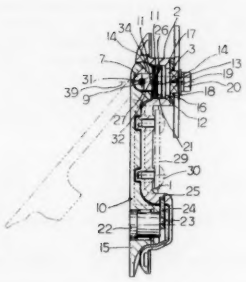
Filed Oct. 30, 1999, Appl. No. 431,038

Claims priority, application Japan, Dec. 22, 1998, 10-364724

Int. Cl.[7] E05C *3/04*

U.S. Cl. 292—202 **5 Claims**

1. A door locking handle assembly of a pull-out and side-swinging lever-action type, comprising:



a stationary casing (**1**) adapted to be fixedly mounted on a door (**8**), said stationary casing (**1**) being provided with a recess in its front surface and a cylindrical portion (**2**) in its base-end portion, wherein said cylindrical portion (**2**) projects rearward from a rear surface of said base-end portion;

a main pin (**3**) rotatably mounted in said cylindrical portion (**2**) of said base-end portion of said stationary casing (**1**) in an insertion manner, said main pin (**3**) being non-axially slidable in said cylindrical portion (**2**) and having its rear-end portion fixed to a catch plate (**6**), wherein said catch plate (**6**) is adapted to be engaged with and disengaged from a receiving portion (**5**) of a stationary frame element(**4**), and said main pin (**3**) is provided with a connecting boss portion (**7**) in its front-end portion;

a control handle (**10**) which has its base-end portion pivoted to said connecting boss portion (**7**) of said main pin (**3**) through a cross pivot (**9**) so that said control handle (**10**) is foldable into and projectable from said recess in said stationary casing (**1**), whereby said control handle (**10**) is side-swingable in its projected position;

a laminated leaf spring (**11**) constructed of a pair of an upper and a lower spring element stacked together, wherein said laminated leaf spring (**11**) is provided with a central through-hole (**12**) through which said laminated leaf spring (**11**) is fixedly mounted on said connecting boss portion (**7**) of said main pin (**3**), said upper spring element of said laminated leaf spring (**11**) being provided with a pair of upwardly protruding portions (**33**, **34**) which are diametrically opposite to each other so as to have said central through-hole (**12**) disposed therebetween, wherein a front surface of said main pin (**3**) faces a rear surface of said laminated leaf spring (**11**) and is curved rearwardly to form a concave portion (**13**);

an engaging projection (**14**) which is provided in a rear surface of said base-end portion of said control handle (**10**) and brought into abutting contact with a front surface of said laminated leaf spring (**11**), wherein after said control handle (**10**) including its grip portion (**15**) is entirely received in said recess in said stationary casing (**1**) and said engaging projection (**14**) has its top portion (**14***a*) positioned in a position oppositely disposed from said grip portion (**15**) of said control handle (**10**) with respect to a reference line (**39**) extending in a direction perpendicular to a front surface of said door (**8**), when said control handle (**10**) is pulled out of said recess in stationary casing (**1**), said top portion (**14***a*) of said engaging projection (**14**) of said control handle (**10**) moves across said reference line (**39**);

a first engaging groove portion (**31**) which is provided in a first oblique surface (**14***b*) of said engaging projection (**14**) of said control handle (**10**) and engaged with said engaging upwardly protruding portions (**33**, **34**) of said laminated leaf spring (**11**) when said control handle (**10**) projects from said stationary casing (**1**); and

a second engaging groove portion (**32**) which is provided in a second oblique surface (**14***c*) of said engaging projection (**14**) of said control handle (**10**) and engaged with said upwardly protruding portions (**33**, **34**) of said laminated leaf spring (**11**) when said control handle (**10**) folds into said recess in said stationary casing (**1**).

6,039,364

SWITCH CABINET FOR ELECTRONICS AND ELECTRICAL ENGINEERING

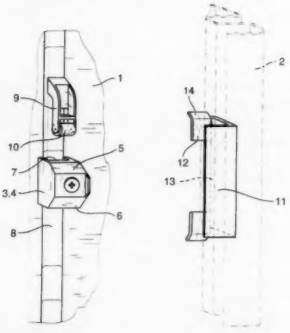
Uwe Rieger, Karlsbad; Klaus Kern, Straubenhardt, both of France, and Daniel Thomas, Seebach, Germany, assignors to Schroff GmbH, Straubenhardt, Germany

Filed Jul. 8, 1998, Appl. No. 111,807

Claims priority, application Germany, Jul. 9, 1997, 197 29 200

Int. Cl.[7] **E05C** *19/00*

U.S. Cl. 292—300 **10 Claims**



1. A switch cabinet for electronics and electrical engineering, having a door hinged at least on one side (**1**), a locking mechanism, and a centering mechanism for the level centering of the door (**1**) when closing, wherein the centering mechanism comprises a centering piece (**3**) and a catching part (**11**) which are arranged in an area of the locking mechanism on the door (**1**) or on a framework element (**2**) of the switch cabinet and interlock when closing the door (**1**), wherein the locking mechanism of the door (**1**) includes a latch member (**9**) and a retaining plate (**12**) for the latch member (**9**), and the catching part (**11**) of the centering mechanism forms the retaining plate (**12**), and wherein the latch member (**9**) is fastened on a movable locking track (**8**) and the centering piece (**3**) comprises a groove (**7**) for guidance along the locking track (**8**).

6,039,365

SEAL-LOCKING MECHANISM

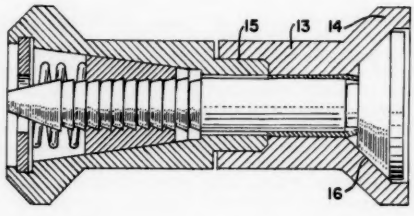
Nikolai Timofeevich Rogatnev, Russian Federation, Moscow, ulitsa Palekhskaya, 11, kv.50, Russian Federation

PCT No. PCT/RU96/00015, § 371 Date Sep. 17, 1997, § 102(e) Date Sep. 17, 1997, PCT Pub. No. WO97/27574, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 26, 1996, Appl. No. 913,540

Int. Cl.[7] **E05B** *39/02*

U.S. Cl. 292—327 **2 Claims**



1. A seal-lock comprising:

a body having a head portion and a substantially cylindrical portion, said head portion and said cylindrical portion being

situated substantially along a longitudinal axis of the seal-lock, said cylindrical portion defining an outer cylindrical surface of said body;

a longitudinal opening in said body, said opening having a substantially cylindrical portion and a substantially conical portion, said conical portion being an inner conical portion and thereby defining an inner conical surface of said body;

a fixing element in the form of at least two separate elements, each capable of being moved along said longitudinal axis of the seal-lock and moved apart from each other in a radial direction of the seal-lock, said separate elements all together forming a substantially frustro-conical body, having an outer surface thereof defining an outer surface of said fixing element, said fixing element being situated inside said inner conical portion of said body, said separate elements of said fixing element being spring-loaded against said inner conical portion of said body such that said outer surface of said fixing element is of a shape that will mate to said inner conical surface of said body;

a shaped longitudinal through opening in said fixing element, said shaped longitudinal through opening being situated substantially along said longitudinal axis of the seal-lock and defining an inner surface of said fixing element, said inner surface having unilaterally beveled serrations;

a locking element having a head portion with a face, a substantially cylindrical middle portion, and a sharpened end, said head portion, middle portion, and sharpened end being situated substantially along said longitudinal axis of the seal-lock, a part of said cylindrical middle portion of said locking element having unilaterally beveled serrations which, when said locking element is inserted into said longitudinal opening in said body, matingly engage with said corresponding unilaterally beveled serrations of said fixing element to lock said locking element and hold said cylindrical middle portion of said locking element inside said shaped longitudinal through opening in said fixing element;

a reduced diameter annular undercut located adjacent to said head portion of said locking element;

a cylindrical bushing rotatably mounted on said locking element covering said undercut;

an information located on said face of said head portion of said locking element;

a cap having a head portion and a substantially cylindrical portion embracing said locking element, said cylindrical portion of said cap defining an outer cylindrical surface thereof and being substantially aligned with said outer cylindrical surface of said body, said head portion of said cap having an inner cavity for receiving said head portion of said locking element; and

wherein the seal-lock can be removed by breaking the locking element at its annular undercut such that the body and cap can be reused.

6,039,366

DOOR HANDLE ASSEMBLY AND METHOD OF MOUNTING

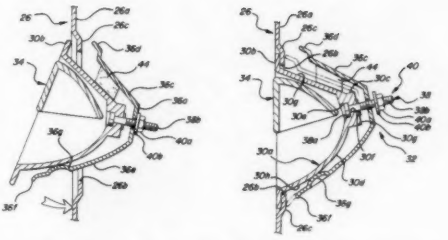
Jimmie Lewis, Rockledge, Fla., assignor to Adac Plastics, Inc., Grand Rapids, Mich.

Filed Mar. 13, 1998, Appl. No. 41,772

Int. Cl.[7] E05C *21/00*

U.S. Cl. 292—352 **7 Claims**

1. An automotive door handle assembly adapted to be mounted in an aperture defined in an outer skin of a motor vehicle door by a door flange having upper and lower edge portions and inner and outer faces, the handle assembly including:



an escutcheon plate sized to fit in the door aperture and having a main body central bowl portion and a peripheral flange extending around the bowl portion and adapted to seat against the outer face of the door flange;

a handle pivotally mounted on the escutcheon plate within the central bowl portion;

a threaded fastener device secured to the central bowl portion of the escutcheon plate and extending rearwardly therefrom;

a clip of U-configuration having a bight portion and upper and lower leg portions extending forwardly from opposite edges of the bight portion in outwardly splayed, outwardly diverging disposition relative to each other and having an aperture in the bight portion fitted over the threaded fastener device to position the clip rearwardly of the bowl portion of the escutcheon plate with the clip leg portions extending forwardly in embracing relation to the bowl portion of the escutcheon plate, the upper leg portion overlying an upper region of the bowl portion of the escutcheon plate and defining a forward clamping free edge flange for clamping engagement against the inner face of the upper edge portion of the door flange to clamp the door flange between the upper leg portion free edge flange and the peripheral flange of the escutcheon plate, the lower leg portion underlying a lower region of the bowl portion of the escutcheon plate and defining a forward clamping free edge flange for clamping engagement against the inner face of the lower edge portion of the door flange to clamp the door flange between the lower leg portion free edge flange and the escutcheon plate peripheral flange;

the handle assembly further including a resilient cushion member fitted between the upper clip leg portion and an adjacent surface of the upper region of the bowl portion of the escutcheon plate; and

the handle assembly further including slide means positioned between the lower leg portion of the clip and an adjacent escutcheon plate surface to facilitate sliding movement of the clip lower leg portion on the adjacent escutcheon plate surface in response to tightening of the fastener device.

6,039,367

OVERPAINTABLE BUMPER WITH ULTRASOUND TRANSDUCER

Harry Muller, Steinheim, and Joachim Mathes, Heilbronn, both of Germany, assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

PCT No. PCT/EP97/00110, § 371 Date Nov. 25, 1998, § 102(e) Date Nov. 25, 1998, PCT Pub. No. WO97/26155, PCT Pub. Date Jul. 24, 1997

PCT Filed Jan. 11, 1997, Appl. No. 117,049

Claims priority, application Germany, Jan. 20, 1996, 196 01 987

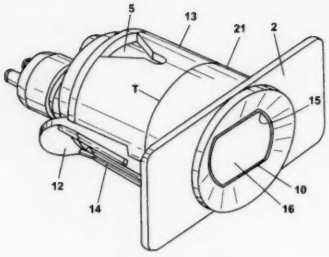
Int. Cl.[7] B60R *19/48;* **G01S** *15/93*

U.S. Cl. 293—117 **10 Claims**

1. A bumper assembly, comprising:

a bumper body,

a holder for acceptance of an ultrasound transducer wherein the holder is attached to the bumper body and has two segments and that the two holder segments are arranged in series in the longitudinal direction of the transducer where the first holder



segment which faces the bumper is connected to the bumper in one piece, and that the second holder segment which faces away from the bumper is permanently connected to the bumper.

6,039,368

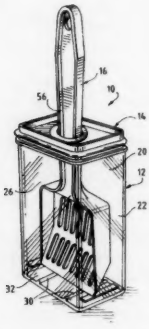
READILY CLEANABLE LITTER CLEANING SYSTEM

Karen Kowalczyk, 1405 Severn Ct., Naperville, Ill. 60565

Filed Feb. 5, 1998, Appl. No. 18,972

Int. Cl.[7] **A01K** *29/00;* **E01H** *1/12*

U.S. Cl. 294—1.3 **9 Claims**



1. A readily cleanable litter cleaning system for removing fecal matter from a litter box, the cleaning system, comprising:

a container having substantially identical front and rear panels joined by substantially identical side panels and a bottom panel, the container having a rectangular cross-section defining an open top and a liquid storage region, the container having a predetermined width along the front and rear panels and a predetermined depth along the side panels, the front, rear and side panels terminating in an upper rim;

at least one projection extending from at least one of the panels into the liquid storage region, the projection terminating in an end in spaced relation from the bottom panel;

a top cover configured for tightly fitting to the container and sealing the container front, rear and side panels at the open top, the cover defining sides and further defining an opening therein in spaced relation to the sides; and

a scoop for removing the fecal matter from the litter, the scoop having a blade portion and an elongated handle, the blade portion having a width configured for placement in the container generally parallel to the front and rear panels and fitting between the side panels, the blade portion further configured for fitting in the container with the blade resting on the at least one container projection, in spaced relation to the bottom,

wherein the container is filled with a quantity of liquid and the scoop is placed in the container and is cleanable by vigorously moving the scoop through the liquid in the container.

6,039,369

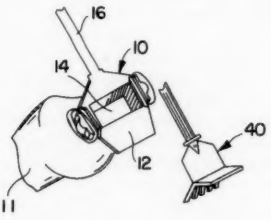
ANIMAL EXCREMENT COLLECTING DEVICE AND COLLECTING TOOL

Robert Stahovic, 708 Venango Ave., Apt. 9, Cambridge Springs, Pa. 16403

Filed Apr. 30, 1998, Appl. No. 70,074

Int. Cl.[7] **A01K** *1/01*

U.S. Cl. 294—1.4 **16 Claims**



11. A collecting structure for the receipt of animal fecal matter comprising a collecting device and a collecting tool;

said collecting device comprises a handle, a generally flat member for the receipt of said fecal matter, and bag securing means;

said handle being attached to an end of said flat member and extending outwardly therefrom;

said flat member having a chute generally centrally disposed and extending therethrough;

said bag securing means being disposed at first and second sides of said flat members adjacent said chute;

said collecting tool comprises a generally flat body member having a first end and a second end, a handle attached to the first end, the second end having a scraping tool extending outwardly therefrom in a first direction, the second end having a raking tool extending outwardly therefrom in a second direction;

a first and second bag securing means each comprises an inner member and an outer member spaced from each other and supported generally parallel to each other;

the first and second bag securing means each further comprise a restricting portion at each end of the outer member whereby a bag portion can be positioned therein and, secured thereby;

the restricting portions comprise a portion of the outer member that extends at an acute angle relative to the inner member forming a wider gap at its outer extreme and a narrower gap at its inner extreme whereby a bag portion may be secured therein.

6,039,370

APPARATUS FOR CAPTURING AND DISPOSING OF ANIMAL LITTER

John C. Dooley, Jr.; Karen R. Meyerson, and John C. Dooley, III, all of 19 Baldwin St., Pennington, N.J. 08534

Filed Jan. 28, 1999, Appl. No. 239,489

Int. Cl.[7] **A01K** *29/00*

U.S. Cl. 294—1.5 **19 Claims**

1. A portable pet toilet device comprising:

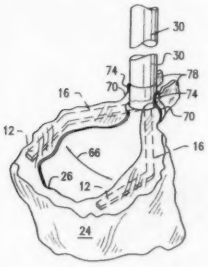
an elongated pole having a first end serving as a handle, and a second end;

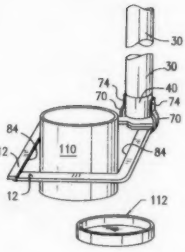
a rod;

means for securing said rod to said second end of said pole, with said rod protruding axially away from said second end;

first and second V-shaped arms, each having flat top and bottom surfaces which are substantially wider than the thickness thereof, each having one end with a through hole for mounting onto said rod and being positioned with an inside corner portion of each arm in opposition to one another, and each having a free end configured for holding a receptacle; and

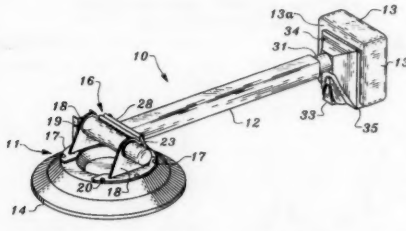
means for retaining said first and second arms on said rod in a fixed position, including means for selectively adjusting the





distance between said first and second arms to accommodate the size of said receptacle to be retained by said arms with said receptacle in an open configuration.

6,039,371
VACUUM STRETCHING AND GRIPPING TOOL AND METHOD FOR LAYING FLOORING
Mark Smith, P.O. Box 1091, San Andreas, Calif. 95249
Filed Aug. 4, 1997, Appl. No. 905,653
Int. Cl.[7] A47G *27/04;* **B25B** *25/00*
U.S. Cl. 294—8.6 **26 Claims**



1. A tool for applying flooring configured as non-textile sheet goods, comprising in combination:

a resilient vacuum suction means placed on the flooring for evacuating air from said vacuum suction means, thereby fastening by flattening said vacuum suction means onto the flooring;

an arm having first and second ends, said first end coupled to said vacuum suction means, extending above the flooring and spaced therefrom;

a pad affixed to said second end whereby the flooring is conformably deployed by moving the flooring in a plane parallel and in tangential registry to an underlying substrate by applying force parallel to the substrate through said pad.

6,039,372
GRILL LIFTING TOOL
Reginald J. Noe, and Toni S. Stroud, both of 611 S. Carbon, Girard, Kans. 66743
Filed Dec. 2, 1998, Appl. No. 204,665
Int. Cl.[7] A47J *45/10*
U.S. Cl. 294—10 **20 Claims**

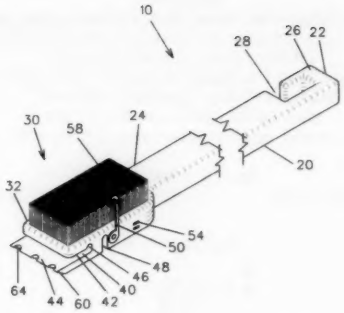
1. A lifting tool for a grate having a plurality of spaced apart bars therein, said tool comprising:

a handle having a proximal end and a distal end relative to a user;

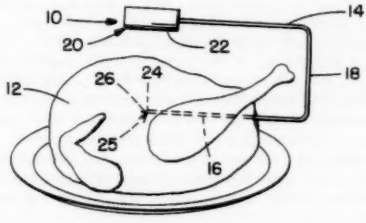
a head at said distal end of said handle, said head presenting an upper surface and a lower surface;

a first slot in said head adapted to receive at least two bars of the grate therein, said first slot presenting upper and lower surfaces positioned on opposed sides of the at least two grate bars in said first slot; and

a second slot in said head and in communication with said first slot, said second slot generally extending from said upper surface of said first slot for capturing one of the grate bars therein upon a user lifting at said handle proximal end, whereby to raise said head and grate captured therein.



6,039,373
DEVICE FOR LIFTING AND HANDLING FOWL OR MEAT
Lois Horn, 33 Old Field Hill Rd., Southbury, Conn. 06488
Filed Dec. 12, 1997, Appl. No. 989,718
Int. Cl.[7] B65G *7/12*
U.S. Cl. 294—15 **12 Claims**



1. A device for facilitating the lifting and handling of a fowl or body of meat, which comprises:

an elongated upper shaft having a proximal end and a remote end, the proximal end including grasping means,

an elongated lower shaft for insertion into and for supporting the fowl or body of meat, the lower shaft having a distal end portion and a remote end, the distal end portion being located below and parallel to the grasping means, the distal end portion including contact means located directly below a center of gravity of the grasping means of the upper shaft when contacting an internal portion of the fowl or body of meat,

connecting means for connecting the remote ends of the shafts, the lower shaft being spaced from and below the upper shaft such that upon insertion of the lower shaft into the fowl or body of meat, a lifting force imparted to the grasping means brings the contact means into contact with an internal portion of the fowl or body of meat which is directly below the center of gravity of the grasping means; and

wherein (i) centerlines of said elongated upper shaft, elongated lower shaft, distal end portion and connecting means are all positioned in a common plane and (ii) the contact means of the lower shaft includes fixation means for fixing the contact means to the fowl or body of meat to prevent movement of the same off the fixation means during lifting and handling.

6,039,374

SUSPENDED COUPLING FOR LIFTING DEVICES, PARTICULARLY FOR PICKING UP AND DEPOSITING THERMAL INSULATION HOODS

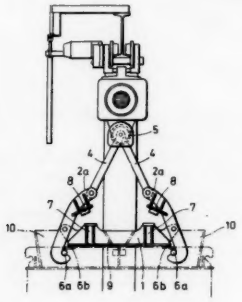
Dieter Klein, Siegen, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Jul. 15, 1998, Appl. No. 115,801

Claims priority, application Germany, Jul. 16, 1997, 297 12 552 U

Int. Cl.[7] **B66C** *1/28*

U.S. Cl. 294—67.31 **3 Claims**



1. A suspended coupling for lifting devices for picking up thermal insulation hoods from wire coils and for placing thermal insulation hoods over wire coils, the coupling comprising a crossbeam having ends, and double arm lever pairs pivotally hinged in a mirror-inverted manner to the ends of the crossbeam, wherein each lever pair comprises an upper first lever arm pair located above the crossbeam and adapted to be connected through connecting rods to the lifting device, and a second lever arm pair located below the crossbeam and having hook-shaped ends, wherein the hook-shaped ends are adapted to be coupled to support projections arranged at an upper side of the thermal insulation hood by moving the hook-shaped ends toward each other by a pulling movement transmitted to the double lever pair by lifting the connecting rods, further comprising pull-type electromagnets and corresponding armatures, wherein the pull-type electromagnets are mounted on the crossbeam and the armatures are respectively mounted on both lever arms of the upper first lever arm pair opposite the pull-type electromagnets, wherein, in a switched-on pulling position, the electromagnets and the armatures hold the upper lever arm pair and the crossbeam in a locked position relative to each other and hold the hook-shaped ends of the lower lever arm pair out of the coupling position from the support projections.

6,039,375

GRIPPER ASSEMBLY WITH INTEGRATED HEAT SHIELD

Thomas C. Bauman, North Prairie, Wis., assignor to ABB Flexible Automation, Inc., New Berlin, Wis.

Filed Jan. 28, 1998, Appl. No. 14,199

Int. Cl.[7] **B25J** *15/00*

U.S. Cl. 294—119.1 **25 Claims**

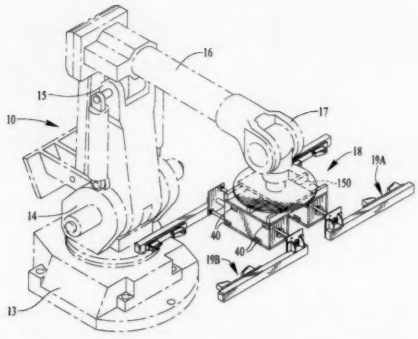
1. An end effector for use with an industrial robot and for grasping a heated object the end effector comprising:

a shell having an interior portion and at least one opening through which a gas may flow into and out of the interior portion of the shell;

two actuators individually mounted to the shell, the shell substantially surrounding and in spaced relation to the actuators;

a jaw coupled to each actuator; and

at least one guide coupled to each jaw, each guide coupled to the shell and for bearing the weight of the jaw coupled to each actuator;



wherein the shell is effective to maintain the actuators at a temperature that is at least about 500° F. less than the temperature of the heated object grasped by the end effector, but not less than the ambient temperature.

6,039,376

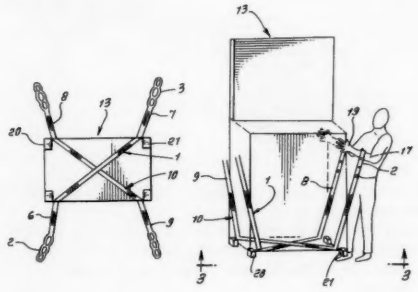
FOREARM FURNITURE LEVERAGE STRAPS

Mark Anthony Lopreiato, 400 N. El Molino Ave., Apt. E, Pasadena, Calif. 91101

Filed Nov. 25, 1997, Appl. No. 977,976

Int. Cl.[7] **B65D** *63/18*

U.S. Cl. 294—152 **10 Claims**



1. Load carrying apparatus, comprising, in combination:

a) first and second elongated straps having end portions,

b) multiple loops at each end portion, and located in planes defined by said end portions and spaced along the length of the strap, to define multiple openings, located in said planes,

c) each strap having a mid-portion located between said strap end portions, and mid-portions of the two straps located to extend under a load to be carried,

d) whereby the user can select which of the loops is to be extended over his forearm, for lifting the load by lifting force exertion to lift said strap mid-portions.

6,039,377

PORTABLE EMERGENCY CARE FACILITY

Charles H. Eberspacher, 2 NW. 61st Ter., Gladstone, Mo. 64188

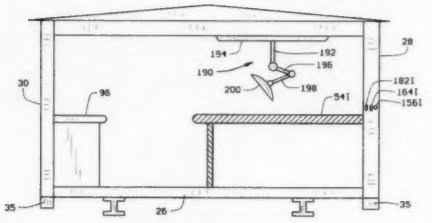
Continuation-in-part of application No. 08/650,467, May 20, 1996, Pat. No. 5,775,758. This application Jul. 6, 1998, Appl. No. 110,211.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B60P** *3/14;* **A61G** *3/00*

U.S. Cl. 296—24.1 **4 Claims**

1. A portable emergency care facility comprising:



an elongate enclosure having first and second ends and two opposing long walls extending between the first and second ends;

a plurality of wheels on the enclosure to facilitate transporting the facility;

a plurality of treatment tables extending from at least one of the long walls toward the center of the enclosure, each of the treatment tables being sufficiently spaced form the others to allow patient access on both sides of the treatment tables; and

a surgical light mounted over at least one of said treatment tables.

6,039,378

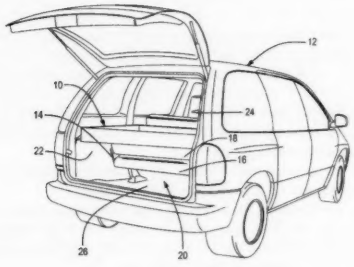
CARGO TRAY FOR A MOTOR VEHICLE

Gary M. Bailey, Stockbridge, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jul. 15, 1998, Appl. No. 115,936

Int. Cl.[7] B60R *7/00*

U.S. Cl. 296—37.16 **14 Claims**



1. In combination with a motor vehicle including an occupant seat and a cargo area defined by a floor and first and second spaced apart vehicle sidewalls, the occupant seat having a fold-down seatback supported for movement between an upright position and a folded position in which the seatback provides a substantially horizontal surface, the improvement comprising a storage device including a bottom surface and a plurality of storage sidewalls interconnected to said bottom surface, the bottom surface operatively attached to the occupant seat, said storage device movable to a stowed position in which said bottom surface is positioned substantially flush against the seatback and an operative position in which said bottom surface cooperates with the substantially horizontal surface of the seatback to provide an elevated support surface extending rearward from the occupant seat, each storage sidewall of said plurality of storage sidewalls foldable so as to be oriented parallel to said bottom surface when said storage device is in said stowed position and perpendicular to said bottom surface when said storage device is in said operative position.

6,039,379

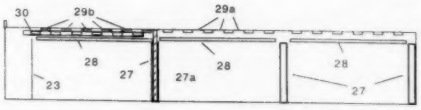
SECURITY COVER FOR PICK-UP TRUCK BEDS

Hakikta Najin Jordan, HC04 Box 9130, Palmer, Ak. 99645

Division of application No. 08/934,822, Sep. 22, 1997. This application Jun. 16, 1999, Appl. No. 334,198.

Int. Cl.[7] B62D *33/02*

U.S. Cl. 296—37.6 **3 Claims**



1. A covering system for a pick-up truck bed, having two oppositely side walls, comprising:

a) A bed liner, removably installed within said pick-up truck bed, said bed liner having a floor, a front wall, and two oppositely disposed sides, said bed liner being shaped to fit a pick-up truck bed;

b) a lower pair of horizontal rails, fixedly attached to the sides of said bed liner, said lower pair of horizontal rails being coplanar and being oppositely disposed on said sides;

c) an upper pair of horizontal rails, fixedly attached to the sides of said bed liner, said upper pair of horizontal rails being coplanar and being oppositely disposed on said sides, said upper pair of horizontal rails further including a plurality of slots formed therein;

d) at least one pair of vertical channels, fixedly attached to said sides, wherein said pair of vertical channels are aligned in a single plane;

e) at least one cover plate, having a plurality of tabs formed thereon, such that said tabs align with said slots in said pair of upper rails, and further such that when said tabs align with said slots in said upper rail, said cover plate passed through said pair of upper rails and rests on said pair of lower rails, and further such that when said cover plate rests on said pair of lower horizontal rails, said cover plate is slidably engaged on said pair of lower horizontal rails;

f) a rear plate, slidably engaged in said pair of vertical channels and further such that said rear plate abuts said cover plate; and

g) a means for lockably securing said cover plate to said rear plate.

6,039,380

KNEE RESTRAINT DEVICE FOR VEHICLES

Alexander Heilig, Wissgoldingen, and Dirk Schultz, Schwäbisch Gmünd, both of Germany, assignors to TRW Occupant Restraitn Systems GmbH & Co. KG, Alfdorf, Germany

Filed Jun. 15, 1998, Appl. No. 94,954

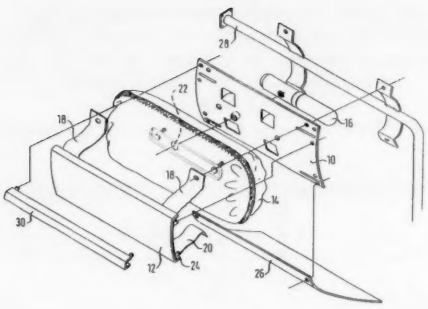
Claims priority, application Germany, Jun. 19, 1997, 297 10 745 U

Int. Cl.[7] B62D *25/14*

U.S. Cl. 296—70 **10 Claims**

1. A knee restraint device for vehicles, comprising:

a base, a knee protector component which is movable towards the knees of a vehicle occupant, a drive means which is arranged between said base and said knee protector component, and catching and positioning means which control a movement path of said knee protector component at least in an up/down direction relative to the vehicle and which, in limits of travel of said drive means, define a predetermined end position of said knee protector component in space, wherein said catching and positioning means are arranged



outside said drive means and said drive means loosely engages said knee protector component.

6,039,381

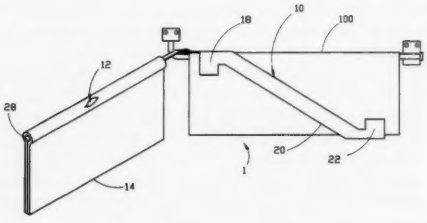
CLIP-ON SIDE SUN VISOR

Andrew W. Klauer, 1104 Mistletoe La., Winneconne, Wis. 54986

Filed Sep. 14, 1999, Appl. No. 395,857

Int. Cl.[7] B60J *3/00*

U.S. Cl. 296—97.6 **14 Claims**



1. A clip-on side sun visor for attachment to a front sun visor of a vehicle comprising:

an attachment device having a downward facing clip on a first end and an upward facing clip on a second end thereof, said downward and upward facing clips being attached to the front sun visor of a vehicle; and

a side sun visor being pivotally attached to said first end of said attachment device such that said side sun visor may be pivoted relative to the front sun visor.

6,039,382

FOLDING TOP FOR A MOTOR VEHICLE

Carl Mather, Lake Orion; Douglas J. Quigley, Rochester Hills, and Glen M. Kondratek, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Jan. 5, 1998, Appl. No. 2,599

Int. Cl.[7] B60J *7/12*

U.S. Cl. 296—107.01 **7 Claims**

1. In combination,

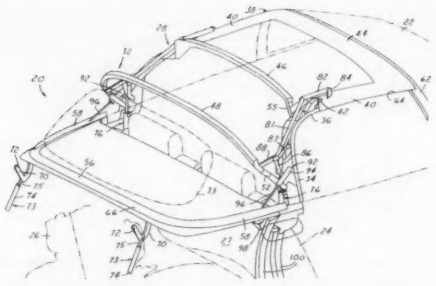
a convertible motor vehicle having a seat, an open-top storage compartment at the rear of said seat, and a tonneau movable from open to closed position relative to the open top of the storage compartment,

a folding top for the vehicle,

said top comprising a flexible, foldable cover,

a frame for supporting said cover,

said frame comprising a pair of laterally spaced apart generally upright side rails,



a roof bow of generally U-shape comprising laterally spaced apart side bars pivotally connected to said respective side rails,

a deck bow of generally U-shape comprising laterally spaced apart side bars pivotally connected to said respective side rails,

a header of generally U-shape comprising a pair of laterally spaced apart side bars pivotally connected to said respective side rails,

said frame being movable to a deployed position in which said roof bow extends upwardly and rearwardly from the pivotal connection of its side bars to said side rails, said deck bow extends rearwardly from the pivot connection of its side bars to said side rails, and said header extends forwardly from the pivotal connection of its side bars to said side rails to support said cover in a position of use,

said frame being movable to a retracted position for storage of said folding top in which said roof bow is pivoted forwardly about the pivotal connection of its side bars to said side rails to a position in which the side bars of said roof bow are generally upright alongside the generally upright side rails in which said deck bow is pivoted upwardly about the pivotal connection of its side bars to said side rails to a position in which the side bars of said deck bow are generally upright alongside the generally upright side rails, and said header is pivoted rearwardly about the pivotal connection of its side bars to said side rails to a generally horizontal position over and above said generally upright side rails, said generally upright roof bow and said generally upright deck bow,

means for moving said frame from the deployed position to the retracted position thereof,

means for moving said tonneau to its open position relative to the open top of said storage compartment,

means for lowering said folding top, when said frame is in its retracted position, into said compartment while maintaining said side rails, roof bow, and deck bow generally upright and said header generally horizontal, and

means for moving said tonneau to its closed position relative to the open top of said storage compartment after lowering thereinto of the folding top.

6,039,383

ROOF CONSTRUCTION FOR A MOTOR VEHICLE

Arno Jambor, Vaihingen, and Oliver Wagner, Filderstadt, both of Germany, assignors to DaimlerChrysler AG, Stuttgart, Germany

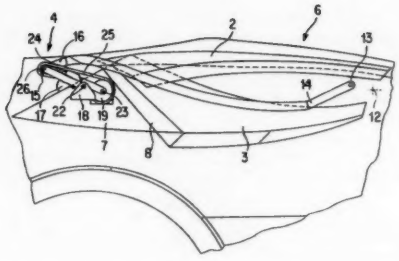
Filed Aug. 27, 1997, Appl. No. 917,730

Claims priority, application Germany, Aug. 27, 1996, 196 34 510

Int. Cl.[7] B60J *7/08*

U.S. Cl. 296—108 **8 Claims**

1. Roof construction for a motor vehicle comprising a dimensionally stable forward roof part which, in a closed operating position thereof, adjoins a windshield frame of a body of the vehicle, a dimensionally stable rearward roof part configured to form C-column sections and be provided with a rear window, the



forward and rear roof parts being swivellably connected with one another, a control mechanism for moving the forward and rear roof parts between a lowered inoperative position and a closed operative position, the rearward roof part, in the lowered inoperative position thereof, being swivelled about a horizontal transverse axis such that rearward ends of the C-column sections, as viewed in a longitudinal direction of the motor vehicle, have free ends which project toward the front of the motor vehicle, wherein, at least in the lowered inoperative position of the C-column sections, at least along a portion of the length of the C-column sections, starting from the rearward ends thereof, wherein the free ends of the C-column sections are free of transverse connection therebetween, and control devices for forward displacement of the rearward roof part in the longitudinal direction are operatively arranged such that, in the inoperative position, the C-column sections at least partially laterally flank a rear area of an interior portion of the motor vehicle.

6,039,384

DOOR SHELL OF A VEHICLE

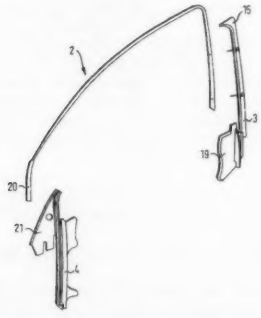
Martin Schulte, Balve, and Ulrich Levermann, Neuenrade-Blintrop, both of Germany, assignors to Schade GmbH & Co. KG, Plettenberg, Germany

Filed Nov. 12, 1998, Appl. No. 191,103

Claims priority, application Germany, Nov. 13, 1997, 197 50 343; Jul. 1, 1998, 198 29 457

Int. Cl.[7] **B60J** *5/04*

U.S. Cl. 296—146.2 **13 Claims**



1. A door shell of a motor vehicle, comprising:

a door housing having an A pillar and a B pillar;

a window frame formed by a shaped profile, the shaped profile having a uniform width along its length, a cross-section, an upper region positioned so as to be spaced above the door housing, a first side corresponding to the A pillar, and a second side corresponding to the B pillar;

a first sheet blank attached to the upper region of the profile at the first side and extending toward the door housing from the upper region of the profile, the first sheet blank being connected to the A pillar of the door housing; and

a second sheet blank attached to the upper region of the profile at the second side and extending toward the door housing from the upper region of the profile, the second sheet blank being connected to the B pillar of the door housing, and wherein the first and second sheet blanks increase in width from the upper region of the profile toward the door housing so as to provide a contact surface area with the door housing having a width greater than the width of the profile.

6,039,385

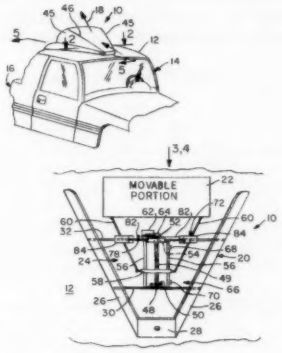
RETRACTABLE AIR DEFLECTOR FOR A VEHICLE

Myron J. Husted, P.O. Box 7, Sasabe, Ariz. 85633

Filed Mar. 16, 1998, Appl. No. 39,935

Int. Cl.[7] **B62D** *35/00*

U.S. Cl. 296—180.3 **30 Claims**



1. A retractable air deflector for mounting to a roof of a cab of a vehicle and for selectively deflecting approaching air upwardly thereover, comprising:

a) a stationary frame for mounting to a roof of a cab of a vehicle; said stationary frame comprising a pair of side walls being straight and upwardly-inwardly inclined and joined transversely at their forward ends by a forward plate;

b) a movable portion movably mounted to said stationary portion and having an up position and a down position; and

c) first means for selectively moving said movable portion relative to said stationary frame through said up and down positions.

6,039,386

FLOOR STRUCTURE OF A VEHICLE

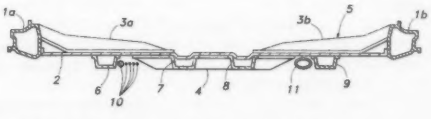
Suehiro Hasshi, and Toshiki Takahashi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1998, Appl. No. 45,122

Claims priority, application Japan, Mar. 24, 1997, 9-088960; Mar. 24, 1997, 9-088961

Int. Cl.[7] **B60J** *7/00*

U.S. Cl. 296—185 **6 Claims**



1. A floor structure of a vehicle, comprising:

left and right side sills;

a substantially flat floor panel extending between the left and right side sills; and

a cross member for connecting the left and right side sills,

wherein the cross member comprises left and right upper members which extend inwardly from the left and right side sills, respectively, and are attached to a top surface of the floor panel having opposing inward end portions spaced from each other, and a lower member, having end portions, extending laterally across a part of a lateral length of the vehicle and attached to an under surface of the floor panel, wherein the end portions of said lower member overlap the end portions of said left and right upper members.

6,039,387

REINFORCEMENT DEVICE FOR SIDE DOORS OF AUTOMOBILES

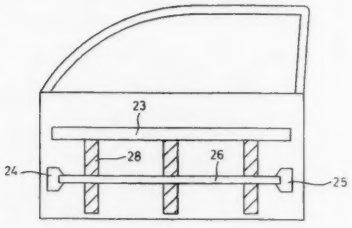
Kuk-Sun Choi, Kyunggi-Do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 16, 1997, Appl. No. 991,252

Claims priority, application Rep. of Korea, Dec. 16, 1996, 96-66440

Int. Cl.[7] B60J *5/04*

U.S. Cl. 296—188 **3 Claims**



1. A reinforcement device for side doors of automobiles, each door having spaced inner and outer panels defining a cavity therebetween, the reinforcement device comprising an impact bar mounted to the outer panel, and an upper reinforcement member mounted to said outer panel at a position above the impact bar, the improvement comprising:

a plurality of U-shaped first reinforcement members in said cavity between the inner and outer panels;

said first members fitted between the inner and outer panels at regularly spaced positions and the recess part of said first members engages the impact bar;

a plurality of second reinforcement members secured along a longitudinal center line of inner surfaces of each of the first members; and

upper sub-reinforcement members formed by bends in top portions of said first members contiguous to the outer panel and secured to said upper reinforcement member.

6,039,388

HOOD OVERSLAM BUMPER FOR AUTOMOBILES

Guk-Sun Choi, Kyunggi-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Oct. 16, 1997, Appl. No. 951,408

Claims priority, application Rep. of Korea, Oct. 18, 1996, 96-46922

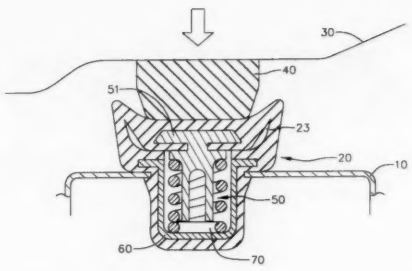
Int. Cl.[7] B60J *5/02*

U.S. Cl. 296—207 **6 Claims**

1. The combination of a hood overslam bumper, a chassis and a hood of an automobile, comprising:

a first bumper member mounted to a lower surface of the hood and having elasticity; and

a second bumper member which comprises a compressible cushion member mounted to a top surface of an upper member of the chassis at a position corresponding to said first bumper member, thus being brought into elastic contact with the first



bumper member when the hood is slammed down, said cushion member being hollow, thus having a cavity; a rod interiorly set in a top center of said hollow cushion member and vertically extending downward within said cavity of the cushion member; a cup-shaped housing set in said hollow cushion member, thus defining a lower portion of the cavity and structurally supporting the cushion member; and a biasing member positioned in said cavity of the cushion member and being stopped by the rod and the housing, thus normally biasing a top wall of said cushion member upwardly.

6,039,389

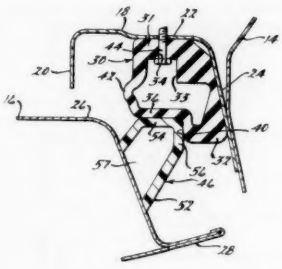
STABILIZATION SYSTEM FOR LIFTGATE

Dave R. Monette, Eastpointe, and Randall D. Kirk, Waterford, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Provisional application No. 60/068,388, Dec. 22, 1997, abandoned. This application Feb. 9, 1998, Appl. No. 21,007.

Int. Cl.[7] B60J *5/00*

U.S. Cl. 296—207 **20 Claims**



1. A stabilization system for stabilizing an openable member relative to vehicle structure of a motor vehicle when in a closed position comprising:

a first member for mounting on either the openable member of the vehicle structure;

a second member for mounting on the other of the openable member or the vehicle structure;

said first member having a generally solid base portion for mounting on the one of the openable member and the vehicle structure and a generally hollow outer portion;

said second member having a base portion for mounting on the other one of the openable member or the vehicle structure and a tapered outer portion, said tapered outer portion being pressed against said hollow outer portion of said first member when the openable member is in the closed position such that said hollow outer portion winks over said tapered outer portion of said second member and secures said second member thereagainst to prevent movement of said second member in at least two directions with respect to said first member.

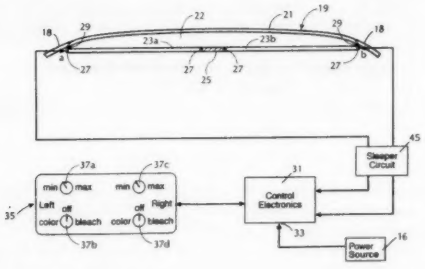
6,039,390
CHROMOGENIC WINDOW ASSEMBLY CONSTRUCTION AND OTHER CHROMOGENIC DEVICES

Anoop Agrawal; Juan Carlos Lopez Tonazzi; Robert Steven LeCompte, all of Tucson, Ariz.; Carl Baertelin, Santa Barbara, Calif., and Douglas Alan Fischer, Grand Rapids, Mich., assignors to Donnelly Corporation, Mich.

Continuation-in-part of application No. 08/699,940, Aug. 20, 1996, abandoned. This application Aug. 20, 1997, Appl. No. 914,876.

Int. Cl.[7] **B60J** *1/20*

U.S. Cl. 296—211 **63 Claims**



1. A chromogenic window panel assembly to be installed in a surface having a surface contour and subject to exposure to a solar radiation source, comprising:

a chromogenic member having an optical property which varies according to an applied signal; and

a light-transmissive outer panel substantially spaced from said chromogenic member, said outer panel being dimensioned and disposed so as to overlap at least a substantial part of the chromogenic member, and having a non-flat surface substantially following the surface contour, wherein said outer panel is disposed between said solar radiation source and said chromogenic member when said window panel assembly is installed in said surface, wherein said chromogenic member comprises a flat, electrochromic member.

6,039,391
HATCH ROOF ATTACHING CONSTRUCTION FOR A T-BAR ROOF CAR

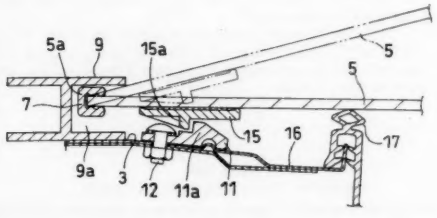
Tomoki Takahashi, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Hamamatsu, Japan

Filed Jul. 10, 1996, Appl. No. 676,637

Claims priority, application Japan, Aug. 15, 1995, 7-207950

Int. Cl.[7] **B60J** *7/11*

U.S. Cl. 296—218 **6 Claims**



1. A hatch roof attaching construction for a T-bar roof car in which an automotive roof is formed with a pair of openings at the right and left of a roof center provided at the center of the roof and detachable hatch roofs are formed at the openings so as to be opened/closed, comprising:

a center hook provided at the roof center having concaves formed at both sides thereof to accommodate the inside edges of the corresponding detachable hatch roofs;

a weather strip mounted at the edge of each of the openings, said weather strip abutting the underside surface of the corresponding hatch roof when the hatch roof is in the closed position; and

at least one pair of engaging members corresponding to each of the detachable hatch roofs, each pair of engaging members comprising first and second engaging members each of said engaging members comprising a claw, said first engaging member being mounted to the upper surface of the roof center in a predetermined position, said second engaging member being mounted on the underside surface of the hatch roof in a predetermined position such that said claws of said first and second engaging members engage with each other in the car width direction when the detachable roofs are in the closed position so that said roofs are reliably positioned in the car width direction with said inside edges thereof being secured in said concaves of said center hook.

6,039,392
DESK AND GROUP OF SIMILAR DESKS

Nils Dencker, Brandstorpsvägen 7, 263 91 Hoeganaes, Sweden

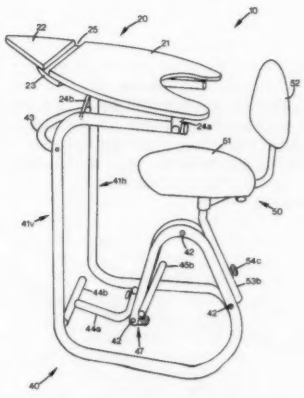
PCT No. PCT/SE96/01288, § 371 Date Mar. 31, 1998, § 102(e) Date Mar. 31, 1998, PCT Pub. No. WO97/13433, PCT Pub. Date Apr. 17, 1997

PCT Filed Oct. 10, 1996, Appl. No. 29,167

Claims priority, application Sweden, Oct. 13, 1995, 9503576

Int. Cl.[7] **A47B** *39/00*

U.S. Cl. 297—172 **16 Claims**



1. A desk including a desk top attached to a frame comprising:

a forward book support surface having an equilateral triangle shape, the support surface being movable between a raised position and a lowered position about a pivot point at a base of the Support surface, the support surface having sides and a rear edge, each side forming a front side edge of the desk top when the support surface is in the lowered position;

a writing surface attached to the base of the support surface, the writing surface having opposite side edges, each side edge having a convex shape that coincides with a periphery of an imaginary circle, the support surface being disposed inside the imaginary circle when the support surface is in the raised position, the support surface having a front portion extending outside the periphery of the imaginary circle when the support surface is in the lowered position; and the writing surface having a straight front edge that is parallel with the base and the writing surface has outwardly curved side edges that form rear side edges of the desk top.

6,039,393

PROTECTIVE COVER FOR BABY SEATS

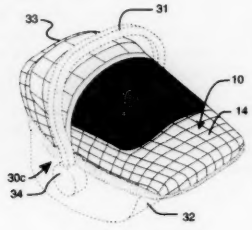
Warren E. Roh, 7753 S. Ames Way, Littleton, Colo. 80123

Continuation of application No. PCT/US96/15553, Sep. 27, 1996, which is a continuation-in-part of application No. 08/593,074, Jan. 29, 1996, abandoned. This application Apr. 15, 1998, Appl. No. 73,002.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A47D** *15/00*

U.S. Cl. 297—184.13 **24 Claims**



1. A method of protecting an occupant of a baby seat with a self-supporting protective cover comprising:

a. covering a space over a baby seat with a canopy supported by a laterally collapsible support element disposed across said canopy and removable with said canopy;

b. attaching said canopy at least partially around said baby seat with a seal attached to said canopy;

c. resisting an entry of insects flying into said space through said canopy and around said baby seat adjacent said canopy; and

d. allowing air flow through a material on at least a portion of one side of said canopy while resisting said entry of said insects.

6,039,394

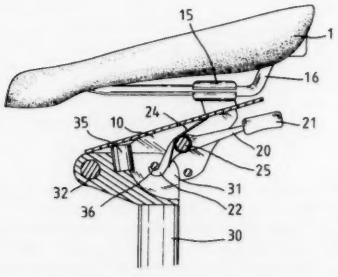
PIVOTABLE SEAT STRUCTURE FOR A BICYCLE

Tian-Chu Chen, Shen Kang Hsiang, Taiwan, assignor to Kalloy Industrial Co., Ltd., Taichung Hsien, Taiwan

Filed Jul. 20, 1999, Appl. No. 356,901

Int. Cl.[7] **B62J** *1/00*

U.S. Cl. 297—195.1 **6 Claims**



1. A pivotable seat structure for a bicycle comprising: a seat post including a block formed on the top thereof, the block having a front end, a rear end and two sides, a positioning post passing through the rear end of the block, an abutting flange formed on each of the two sides of the block, and an elastic pad mounted on the middle of the block; a substantially inverted U-shaped supporting bracket abutting the abutting flange and defining a receiving space for receiving the block, the supporting bracket having a front end pivotally mounted on the front end of the block and a rear end having a side wall defining a sector slot; a substantially inverted V-shaped driver pivotally mounted in the receiving space and having a front end formed with a hook detachably urged on the positioning post and a rear end passing through the sector slot and formed with a press block; a torsion spring mounted in the receiving space and having a front end abutting the front end of the driver for forcing the hook to urge on the positioning post, and a rear end urged on the bottom of the supporting bracket; and a seat fixedly mounted on the supporting bracket.

6,039,395

BICYCLE SADDLE

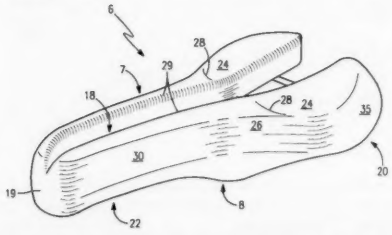
Russell D. Culbertson, Austin, Tex., assignor to Wabuco, Austin, Tex.

Continuation-in-part of application No. 09/028,617, Feb. 24, 1998, Pat. No. 5,918,931, Provisional application No. 60/038,474, Feb. 24, 1997. This application Jul. 6, 1999, Appl. No. 347,939.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B62J** *1/00*

U.S. Cl. 297—202 **12 Claims**



10. In a bicycle saddle having a central opening adapted to align generally with a central portion of the perineal opening of the cyclist's pelvic bone, the improvement comprising:

(a) a right ridge support surface extending laterally on a right side of the saddle at a swept back angle with respect to a plane perpendicular to a longitudinal axis of the saddle;

(b) a left ridge support surface extending laterally on a left side of the saddle at the swept back angle with respect to a plane perpendicular to the longitudinal axis of the saddle;

(c) a right aft support surface positioned toward a rear of the saddle with respect to the right ridge support surface, the right aft support surface including a surface adapted to align generally with the right tuberosity of the cyclist's ischium when the cyclist is seated on the saddle;

(d) a left aft support surface positioned toward the rear of the saddle with respect to the left ridge support surface, the left aft support surface including a surface adapted to align generally with the left tuberosity of the cyclist's ischium when the cyclist is seated on the saddle;

(e) a right nose portion extending forwardly from an inside edge of the right ridge support surface;

(f) a left nose portion extending forwardly from an inside edge of the left ridge support surface;

(g) a right forward surface positioned toward the front of the saddle with respect to the right ridge support surface, the right forward surface extending along at least a portion of the right ridge support surface; and

(h) a left forward surface positioned toward the front of the saddle with respect to the left ridge support surface, the left forward surface extending along at least a portion of the left ridge support surface.

6,039,396

BICYCLE SEAT AND SEAT COVER

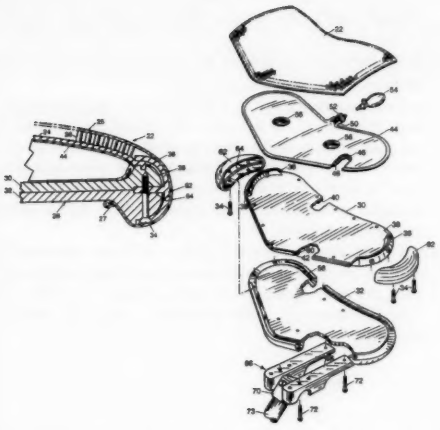
Paul Muser, Oakville, Canada, assignor to Supima Holdings Inc., Oakville, Canada

Filed Mar. 5, 1997, Appl. No. 811,659

Int. Cl.[7] **B62J** *1/18*

U.S. Cl. 297—214 **3 Claims**

1. A seat having a supporting base and a covering, the covering having a planar base sheet made of resilient material disposed over



the supporting base and a plurality of resilient spaced columns integrally formed with said base sheet, each of the columns having a wide end adjacent to the base sheet and a free narrow end remote from the base sheet, each of the columns extending outwardly on one side of the base sheet away from said supporting base, said columns being adapted to create a flow path for ambient air to flow around and within free spaces defined between the columns, and to flex independently from one another and to converge together or diverge from one another in response to the movement or anatomy of a person, so that friction resulting from relative movement between the covering and a person is minimized.

6,039,397

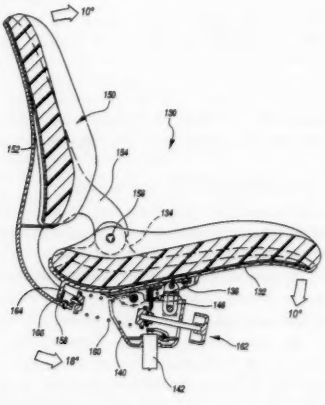
TILT BACK CHAIR CONTROL

Jonathan Ginat, 26 W. 9th St., New York, N.Y. 10011

Division of application No. 08/481,718, Jun. 7, 1995, Pat. No. 5,725,276. This application Mar. 6, 1998, Appl. No. 36,703.

Int. Cl.[7] A47C *3/00*

U.S. Cl. 297—289 **7 Claims**



1. A chair comprising:

a seat member;

a bracket assembly mounted to said seat member and having means for connection of said seat member to a base pedestal, said bracket assembly further including pivot means for pivotable movement of said seat member relative to said base pedestal;

a pair of back support brackets each connected to said seat member along opposite edges thereof and extending upwardly from said seat member;

a back member; and

means for pivotably connecting said back member to said back support brackets, said means including a pair of arms each extending forwardly of said chair from a side of said back member wherein said back member is pivotable about an axis lying above the seat member.

6,039,398

DEVICE FOR ADJUSTING THE INCLINATION OF THE BACK-REST RELATIVE TO THE SEATING PORTION IN CHAIRS IN GENERAL

Claudio Gorgi, and Claudio Taverna, both of Rossano Veneto, Italy, assignors to Imarc S.p.A., Rossano Veneto, Italy

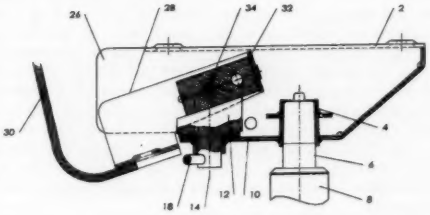
PCT No. PCT/EP96/05795, § 371 Date Sep. 14, 1998, § 102(e) Date Sep. 14, 1998, PCT Pub. No. WO97/23152, PCT Pub. Date Jul. 3, 1997

PCT Filed Dec. 20, 1996, Appl. No. 91,482

Claims priority, application Italy, Dec. 22, 1995, VE95A0051

Int. Cl.[7] B60N *2/22*

U.S. Cl. 297—354.1 **12 Claims**



1. A device which adjusts an inclination of a backrest to a seating portion in chairs in general, comprising a first structural element (**2**) rigid with the seating portion and a second structural element (**28**) rigid with the back-rest and hinged to the first structural element on a traverse hinging axis (**34**), characterised in that with one of the first and second structural elements (**2**, **28**) there is attached a first member (**12**) provided with an inclined surface (**16**) and rotating about a rotational axis (**14**) which intersects said transverse hinging axis (**34**), with the other of the first and second structural elements (**28**, **2**) there being attached a second member comprising at least one cylinder portion centered on a longitudinal axis and (**32**) maintained constantly with its circumferential surface resting on said inclined surface (**16**) along a line, for any angular position of said first member (**12**), the longitudinal axis of said cylinder portion (**32**) intersecting the point of intersection of the rotational axis of said first member (**12**) with the transverse hinging axis on which said first structural element (**2**) and said second structural element (**28**) are hinged together.

6,039,399

LINEAR SEAT RECLINER

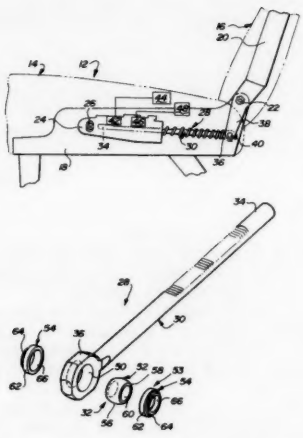
John F. Whalen, Macomb, and David L. Robinson, Sterling Heights, both of Mich., assignors to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Sep. 3, 1998, Appl. No. 146,548

Int. Cl.[7] B60N *2/20;2/22*

U.S. Cl. 297—362.12 **25 Claims**

1. In a linear seat recliner for use in a seat assembly to selectively position a seatback with respect to a seat bottom, the linear seat recliner having a housing adapted to be secured to one of the seatback and the seat bottom and a recliner rod having a first end supported by the housing and a second end adapted to be secured to the other of the seatback and the seat bottom, the improvement comprising a ball joint disposed within an aperture formed in the



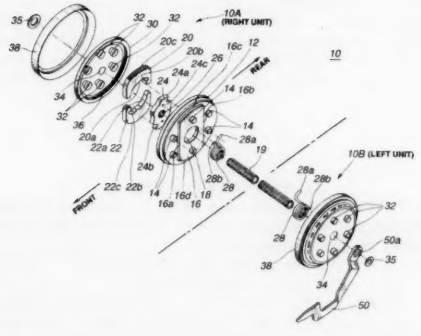
second end of the recliner rod, said ball joint including a retainer defining a socket and a ball swivel rotatably supported in said socket and defining a throughbore adapted to receive a hinge pin for securing the second end of the recliner rod to the seatback or the seat bottom, said retainer having a smooth planar outer circumferential face slidably positionable within said aperture to permit axial movement of said retainer within said aperture and an annular abutment face between said outer circumferential face and said socket, wherein said recliner rod includes a flange on said second end and extending into said aperture for engaging said planar annular abutment face of the retainer to fixedly position the retainer within the aperture preventing said axial movement within said aperture.

6,039,400

SEAT RECLINING DEVICE

Tomonori Yoshida, Yokohama, and Moriyuki Eguchi, Kanagawa, both of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 22, 1998, Appl. No. 102,651
Claims priority, application Japan, Aug. 27, 1997, 9-244858
Int. Cl.[7] B60N *2/20*
U.S. Cl. 297—367 **7 Claims**



1. A seat reclining device for a seat having a seat cushion and a seatback which is pivotal relative to said seat cushion, comprising:

a first plate adapted to be secured to a rear part of the seat cushion, said first plate having a first circular opening formed therein;

a second plate adapted to be secured to a lower end of said seatback, said second plate having a second circular opening formed therein;

a drive shaft passing through said first and second circular openings of said first and second plates;

a lock mechanism actuated by said drive shaft, said lock mechanism being interposed between said first and second plates to lock said second plate at a desired angular position relative to said first plate and assume a lock condition when said drive shaft is turned in a first direction and cancel the locked condition of said second plate when said drive shaft is turned in a second direction; and

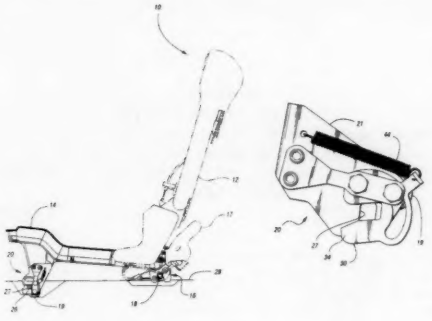
a coil spring disposed about said drive shaft and positioned in said first circular opening, said coil spring being incorporated with said lock mechanism in such a manner as to bias said lock mechanism to assume the locked condition of said second plate.

6,039,401

SELF-LATCHING AND SELF-RELEASING LATCH MECHANISM FOR REMOVABLE SEAT

Liviu Rus, Troy, Mich., assignor to Lear Corporation, Southfield, Mich.

Filed Jul. 28, 1997, Appl. No. 901,729
Int. Cl.[7] B60N *2/10*
U.S. Cl. 297—378.13 **3 Claims**



1. An apparatus for a vehicle comprising:

a collapsible and removable utility seat assembly having a front portion;

a vehicle floor pan with a latch rod thereon;

a bracket attached to the front portion of the utility seat assembly and having a wheel attached thereto, said bracket having a slot therein for receiving the latch rod; and

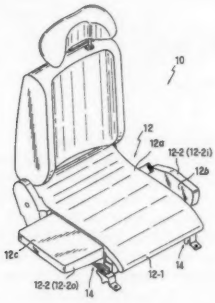
a locking mechanism connected to the bracket, said locking mechanism including a lock member rotatably mounted to the bracket and said locking mechanism having a forwardly protruding leg extending sufficiently forward for automatic engagement with the floor pan in front of the latch rod as the seat assembly is pivotally collapsed forwardly in the vehicle, such that said engagement of the leg with the floor pan causes relative rotation of the lock member with respect to the bracket to move the lock member to a position securing the latch rod within the slot and preventing vertical movement of the seat assembly away from the floor pan, thereby facilitating automatic self-locking of the locking mechanism onto the latch rod as the utility seat assembly is pivotally collapsed.

6,039,402

SEAT PROVIDED WITH A SEAT CLIMBING/DESCENDING AID STRUCTURE FOR EASY CLIMBING ONTO AND DESCENDING FROM THE SEAT, AND A SEAT CLIMBING/DESCENDING AID DESIGNED FOR THAT PURPOSE

Akira Nemoto, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1999, Appl. No. 248,984
Int. Cl.[7] B60N *2/02*
U.S. Cl. 297—411.34 **7 Claims**



1. A seat provided with a seat climbing/descending aid structure, the seat including a seat cushion of a type having a seating surface inclined backwardly thereof wherein an area of the seating surface on which a driver, passenger or an occupant on the seat will place his or her buttocks portion is located at a point below a forward area of the seating surface, characterized in that said seat cushion is formed by: a seat cushion body having a seating surface defined on the upper side thereof; and a pair of bucket-like side support members, each being provided at right and left sides of said seat cushion body in such a manner as to erect therefrom, respectively, wherein said pair of bucket-like side support members have their respective cushion surfaces facing towards said seat cushion body, and said seat cushion body and pair of bucket-like side support members are provided separately from each other, wherein one of said pair of bucket-like side support members, which is located at a side through which the driver, passenger or occupant on the seat will move his or her buttocks portion when climbing onto and descending from the seat, is formed as a movable side support member, wherein said movable side support member is rotatable toward a horizontal use position where the cushion surface thereof is turned upward on a generally horizontal plane and may be retained there, so as to function as a seat climbing/descending aid for allowing the driver, passenger or occupant on the seat to easily climb onto and descend from the seat, and also characterized in that a backward portion of said seat cushion body has a support point in the seat, while a forward end portion of the seat cushion body is rotatable about said support point so as to be lowered, with such an arrangement that a predetermined operation causes said forward end portion of the seat cushion body to be lowered, whereby the seating surface of said seat cushion may be set on a generally same horizontal plane with and generally in registry with the cushion surface of said movable side support member which is set in said horizontal use position.

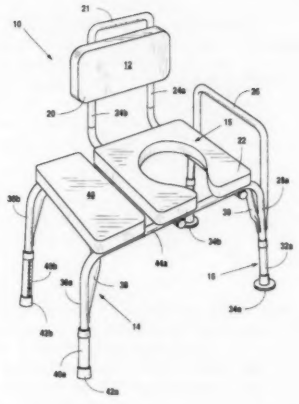
6,039,403

SHOWER/TUB TRANSFER CHAIR

Todd Hargroder, 7626 Grissom Rd., San Antonio, Tex. 78251

Filed Apr. 16, 1998, Appl. No. 61,767
Int. Cl.[7] A47C *7/00*
U.S. Cl. 297—440.24 **1 Claim**

1. An improvement to a shower or bathtub transfer chair where the transfer chair includes a four-legged, longitudinal, support frame structure and a removable, right angled chair structure, the improved transfer chair comprising:



an inside leg frame component comprising first and second inside legs and a connecting inside leg cross-member, each of said inside legs comprising a post portion and an orthogonal extension, said extension comprising and defining a portion of an overall length of said transfer chair;

an outside leg frame component comprising first and second outside legs and a connecting outside leg cross-member, each of said outside legs comprising a post portion and an orthogonal extension, said extension comprising and defining a portion of an overall length of said transfer chair;

a first cross frame component, said first cross frame component detachably connecting said inside leg frame component with said outside leg frame component by removable insertion into and between said orthogonal extensions of said first inside and outside legs;

a second cross frame component, said second cross frame component detachably connecting said inside leg frame component with said outside leg frame component by removable insertion into and between said orthogonal extensions of said second inside and outside legs, wherein a combination of said cross frame components and said inside leg frame component and said outside leg frame component, serves as said four-legged, longitudinal, support frame structure;

a chair back member comprising a planar back support and a plurality of parallel support posts; and

a chair seat member comprising a planar seat support and a plurality of parallel tubular support members, said parallel tubular support members each having a longitudinal Portion and an orthogonal extension, said chair seat member removably attachable to said chair back member at an angle generally perpendicular thereto, by removable insertion of said support posts into said orthogonal extensions of said parallel tubular support members, a combination of said chair back member and said chair seat member removably attachable to said four-legged, longitudinal, support frame structure.

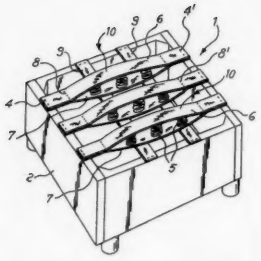
6,039,404

STRUCTURE FOR SUSPENSION IN ARTICLES OF FURNITURE OR THE LIKE AND METHOD FOR THE ASSEMBLY OF SAID STRUCTURE

Anacleto Fontana, Lesmo, Italy, assignor to Cintal S.a.s. di Fontana Paola & C, Monza, Italy

Continuation of application No. PCT/EP97/01864, Apr. 14, 1997. This application Mar. 25, 1998, Appl. No. 47,737.
Claims priority, application Italy, Sep. 19, 1996, MI96A1929
Int. Cl.[7] A47C *7/02*
U.S. Cl. 297—452.64 **8 Claims**

1. A suspension structure in an article of furniture, comprising at least two pairs of elastic-interwoven straps positioned substantially parallel and in tension between two opposite sides of a frame of the



article of furniture, at least one pair of the elastic-interwoven straps including a first strap and a second strap being superimposed and linked together to form a space, at least one spiral spring being lodged inside of the space, at least one elastic strap positioned below and substantially perpendicular to the two pairs of elastic-interwoven straps and being fixed to two opposite sides of the frame of the article of furniture.

6,039,405

SEGMENT MOUNTED ON VEHICLE WHEEL OR ENDLESS RUBBER TRACK

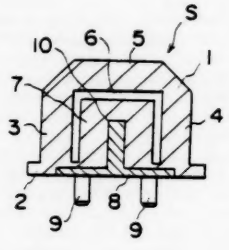
Tomoyuki Kurata; Youichi Kumano, and Kazuya Takahashi, all of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Division of application No. 08/758,449, Nov. 29, 1996. This application Nov. 9, 1998, Appl. No. 188,287.

Claims priority, application Japan, Dec. 3, 1995, 7-337848; Feb. 9, 1996, 8-048045

Int. Cl.[7] B60B *15/00*

U.S. Cl. 301—43 **3 Claims**



1. A segment of rubber elastic material mounted on the outer periphery of a wheel or an endless rubber track, comprising:

a bottom section mounted in contact with said wheel or said endless rubber track;

side sections;

an outer surface section formed on the ground-contacting side of said segment;

a hollow section defined by said bottom section, said side sections and said outer surface section and formed through said elastic segment along the width of said wheel or endless rubber track; and

a stopper protruded into said hollow section from said bottom section, to extend along the width of said wheel or said endless rubber track, said stopper being kept out of contact with the inner surface of said hollow section under a static load,

wherein the distance between the top surface of said stopper and a part of the inner surface of said outer surface section of said segment nearest to said stopper is larger at front and rear ends of said part and small at a central portion of said part along the direction in which the vehicle is driven.

6,039,406

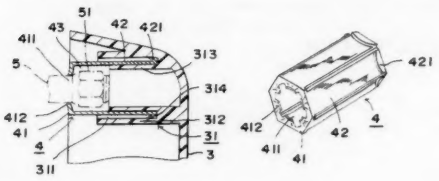
HUBCAP FASTENER STRUCTURE

Lih-Ching Sheu, Tainan Hsien, Taiwan, assignor to Kuan Hsieng Industrial Co., Ltd., Taipei Hsien, Taiwan

Filed May 13, 1998, Appl. No. 76,797

Int. Cl.[7] B60B *7/06*

U.S. Cl. 301—108.4 **5 Claims**



1. A hubcap fastener structure comprising

a cap having a plurality of fastening mounts, each said fastening mount having extending therefrom an outer tubular mount and an inner tubular mount with a gap formed between the outer tubular mount and the inner tubular mount;

a plurality of fittings, each said fitting having an attachment surface and a mounting hole in the attachment surface, wherein a plurality of retainer claws extend from an edge of the mounting hole in the attachment surface radially inwardly towards a center of the mounting hole, and a first end of each of a plurality of retainer strips extends from an outer edge of the attachment surface transversely relative to said retainer claws; and

a plurality of engagement hooks positioned at a second end of each said retainer strip opposite said first end extending from the attachment surface,

wherein said retainer claws and engagement hooks are resilient and said retainer claws are short relative to said retainer strips,

wherein each of the fittings is arranged to be installed by inserting the retainer strips of the fittings into the gap between the outer tubular mount and the inner tubular mount such that said engagement hooks resiliently engage both said inner tubular mount and said outer tubular mount to secure the fittings to said fastening mounts, and

wherein said retainer claws are arranged such that upon inserting the mounting holes of the fittings over bolts projecting from a vehicle hub, the retainer claws engage said bolts to secure the fittings to the bolts.

6,039,407

HUB EXTENDER WITH TOOL CLEARANCE PASSAGEWAYS AND DRIVE NUTS FOR HUB AND BRAKE ASSEMBLY

Michael F. Wiacek, Dearborn, and Gary L. Koch, Plymouth, both of Mich., assignors to Kelsey-Hayes Company, Livonia, Mich.

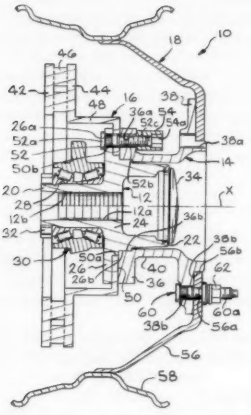
Provisional application No. 60/012,026, Feb. 21, 1996. This application Feb. 21, 1997, Appl. No. 802,955.

Int. Cl.[7] B60B *27/00*

U.S. Cl. 301—111 **19 Claims**

1. A hub extender for use in a hub, wheel and brake assembly comprising:

an inboard flange, an outboard flange, and a main body extending between and interconnecting said inboard flange to said outboard flange, said inboard flange including at least one stud receiving hole formed therein to receive a mounting stud and a nut for securing said hub extender to the hub, wheel and brake assembly, said outboard flange including at least one tool clearance passageway formed therein, said tool clearance passageway being generally coaxially aligned with said stud receiving hole to enable a tool to extend through said tool clearance passageway for manipulating the nut, said inboard flange of said hub extender defining a hub pilot surface for an associated inner surface of the hub, and said outboard flange



of said hub extender defining a wheel pilot surface for an associated surface of the wheel.

6,039,408

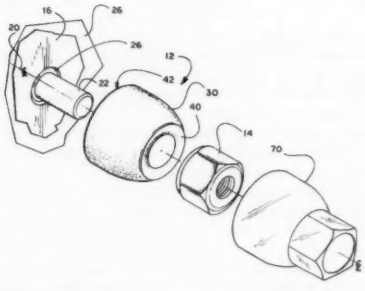
BREAK-AWAY LUG NUT POSITIONER

William Alvarez, 917 Sam Hunt Rd., Fairmont, Ga. 30139

Provisional application No. 60/064,084, Nov. 3, 1997. This application Nov. 2, 1998, Appl. No. 184,916.

Int. Cl.[7] B60B *23/00*

U.S. Cl. 301—111 **27 Claims**



1. A break-away lug nut positioner for rapid race car tire changes configured for attachment to a wheel having a mounting plate with at least one mounting hole, the wheel configured for receipt on a hub defining a hub face, the hub including at least one threaded stud that extends through the mounting hole when the wheel is received on the hub with the mounting plate flush against the hub face, the stud defining threads for engaging the threads of a lug nut, comprising:

a spacer defining a first edge configured for attachment to the lug nut and a second edge configured for attachment to the wheel mounting plate;

the spacer further defining a cavity configured such that, when the wheel is received on the hub with the mounting plate flush against the hub face with the stud extending through the mounting hole and the lug nut is adjacent to the first edge of the spacer and the second edge of the spacer is adjacent to the wheel mounting face with the lug nut aligned with the mounting hole, the stud extends into the spacer cavity and the threads of the stud are positioned adjacent to the threads of the lug nut for easy installation of the lug nut on the stud; and

the spacer further configured to break apart and separate from the lug nut as the lug nut is installed on the stud.

6,039,409

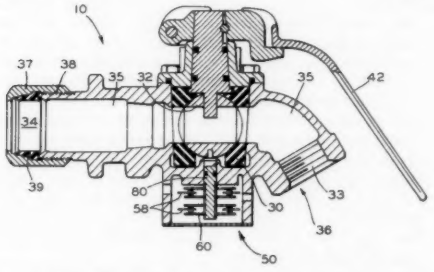
SHUTOFF VALVE ASSEMBLY

Thomas E. Engle, Clayton, N.Y., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 8, 1997, Appl. No. 947,799

Int. Cl.[7] B61G *5/00*

U.S. Cl. 303—7 **20 Claims**



1. A railroad brake line shutoff valve assembly for connection to a car-mounted railway brake line disposed on a first railway vehicle and to a brake line air hose, such brake line air hose for terminating in a gladhand assembly, such gladhand assembly for connection to a similar gladhand assembly on a second railway vehicle coupled to such first railway vehicle, said shutoff valve assembly comprising:

a stationary valve portion and a moveable valve portion, said stationary valve portion having a first fluid line attachment site for attachment of such car mounted railway brake line and a second fluid line attachment site for attachment of such brake line air hose, a motion of said moveable valve portion relative to said stationary valve portion to a first position opening a flowpath through a valve portion between said first fluid line attachment site and said second fluid line attachment site so that such brake line air hose is connected to such car-mounted railway brake line and a motion of said moveable valve portion relative to said stationary valve portion to a second position closing said flowpath through said valve portion between said first fluid line attachment site and said second fluid line attachment site so that such brake line air hose is not connected to such car mounted railway brake line;

an electrical switch for connection to a predetermined number of car-mounted electrical trainline conductors mounted on such first railway vehicle and to a predetermined number of electrical line end segments, such electrical line end segments terminating in a multiple contact electrical trainline connection means, such electrical trainline connection means for connection to a similar electrical trainline connection means on such second railway vehicle coupled to such first railway vehicle, said electrical switch having a stationary portion and a moveable portion, said stationary portion of said switch having a junction portion, said junction portion having a predetermined number of first electric line attachment sites for attachment of such predetermined number of car mounted electrical trainline conductors, said junction portion further having a predetermined number of second electric line attachment sites for attachment of such electrical line end segments, and said junction portion further having a predetermined number of third electric line attachment sites, said third electric line attachment sites having electrical connections to respective members of said first electric line attachment sites, said third electric line attachment sites for connection of respective conductors of a branch electric line to at least one of an electronic system and an electrical system located on such first railway vehicle;

a motion of said moveable portion of said switch relative to said stationary portion of said switch to a first position making a predetermined number of switch electrical connections between individual members of said first electric line attachment sites and said second electric line attachment sites so that such electrical line end segments are electrically connected to respective members of such car mounted electrical

trainline conductors and a motion of said moveable portion of said switch relative to said stationary portion of said switch to a second position breaking said switch electrical connections between said first electric line attachment sites and said second electric line attachment sites so that such electrical line end segments are not electrically connected to such electrical trainline conductors;

said stationary portion of said electrical switch being mechanically connected to said stationary valve portion and said moveable portion of said electrical switch being mechanically connected to said moveable valve portion, so that when said valve portion is in said first valve position, then said switch is in said first switch position and when said valve portion is in said second valve position, then said switch is in said second switch position, so that when said moveable valve portion is placed in said first valve position relative to said stationary valve portion so that said shutoff valve is opened said electrical switch is closed and so that when said moveable valve portion is placed in said second valve position relative to said stationary valve portion so that said shutoff valve is closed said electrical switch is opened; and

means attached to at least one of said moveable valve portion and said moveable portion of said switch for moving said moveable valve portion from said first valve position to said second valve position and said moveable portion of said switch from said first switch position to said second switch position, and for moving said moveable valve portion from said second valve position to said first valve position and said moveable portion of said switch from said second switch position to said first switch position.

6,039,410

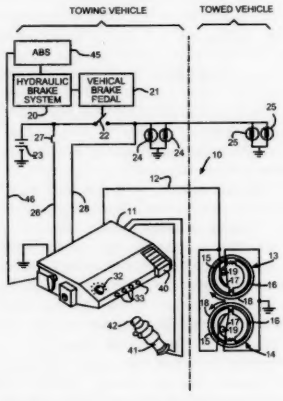
ELECTRONIC TRAILER BRAKE CONTROLLER

Charles L. Robertson, Horton, Ala.; Michael A. Hedding, Canton, and Michael C. McGrath, Farmington Hills, both of Mich., assignors to Hayes Lemmerz International, Inc., Northville, Mich.

Provisional application No. 60/038,294, Jan. 10, 1997. This application Jan. 9, 1998, Appl. No. 4,984.

Int. Cl.[7] B60T *13/00;13/66;7/20*

U.S. Cl. 303—7 **25 Claims**



1. A trailer brake controller comprising:

a brake control signal generator for generating a brake control signal;

a microprocessor connected to said brake control signal generator and responsive to said brake control signal to generate an output brake actuation signal which is related to said brake control signal by a brake controller gain;

a memory connected to said microprocessor; said memory storing a plurality of predetermined brake controller gains; and

a gain control for producing a gain control signal, said gain control connected to said microprocessor, said gain control operable by a vehicle operator to select a gain control signal, said gain control maintaining said selected gain control signal once said gain control is set by said operator, said microprocessor being responsive to said gain control signal to select one of said predetermined gains from said memory for said brake controller gain.

6,039,411

BRAKE CONTROL SYSTEM FOR A VEHICLE

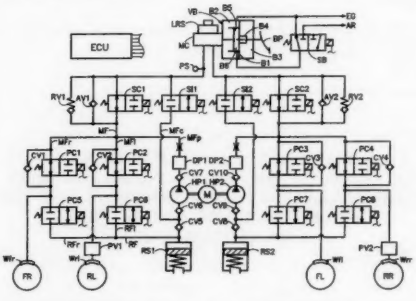
Kenji Tozu, Yokkaichi; Takayuki Itoh, Nagoya; Masanobu Fukami, Hazu gun, and Satoshi Yokoyama, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 29, 1999, Appl. No. 301,338

Claims priority, application Japan, Apr. 30, 1998, 10-137787

Int. Cl.[7] B60T *8/40*

U.S. Cl. 303—116.1 **12 Claims**



1. A brake control system for a vehicle comprising:

wheel brake cylinders operatively mounted on front and rear wheels of said vehicle, said wheel brake cylinders being divided into two sets of wheel brake cylinders, each having two wheel brake cylinders;

a master cylinder for pressurizing brake fluid in a reservoir to supply pressurized brake fluid to said wheel brake cylinders in response to depression of a brake pedal;

a first hydraulic braking pressure circuit and a second hydraulic braking pressure circuit for communicating said master cylinder with each of said two sets of wheel brake cylinders, respectively;

two sets of modulator means disposed in said first and second hydraulic braking pressure circuits, respectively, each of said modulating means modulating the braking pressure in each of said wheel brake cylinders;

a pair of hydraulic pressure pumps disposed in said first and second hydraulic braking pressure circuits, respectively, each of said pumps introducing from an inlet thereof the brake fluid and pressurizing the brake fluid to supply the pressurized brake fluid to each of said wheel brake cylinders through each of said modulator means;

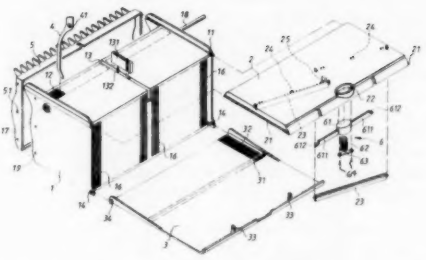
two sets of first valve means disposed in said first and second hydraulic braking pressure circuits, respectively, each of said first valve means opening or closing a first passage for communicating said master cylinder with said modulator means, and said first valve means normally opening said first passage;

two sets of second valve means disposed in said first and second hydraulic braking pressure circuits, respectively, each of said second valve means opening or closing a second passage for communicating said reservoir directly with the inlet of each of said pumps, or communicating said reservoir with the inlet of each of said pumps through said master cylinder, and each of said second valve means normally closing said second passage;

auxiliary pressurization means for supplying pressurized brake fluid to each of said first and second hydraulic braking pres-

sure circuits including said second valve means at the inlets of said pumps, respectively, to perform an auxiliary pressurization, at least when said second valve means opened said second passage; and

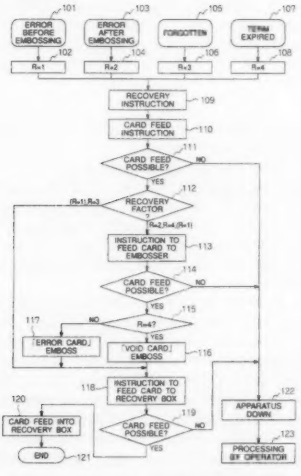
control means for actuating said modulator means, in the case where at least said second valve means in said first hydraulic braking pressure circuit opens said second passage, and said auxiliary pressurization means performs the auxiliary pressurization, to block the communication between said wheel brake cylinders in said second hydraulic braking pressure circuit, when said brake pedal is not depressed, and to communicate said wheel brake cylinders in said second hydraulic braking pressure circuit with said master cylinder, when said brake pedal is depressed.



6,039,412
CARD RECOVERY METHOD AND CARD ISSUING APPARATUS

Osamu Kazo, and Tsuyoshi Kokubo, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 14, 1998, Appl. No. 114,899
Claims priority, application Japan, Jul. 14, 1997, 9-188285
Int. Cl.[7] H03M *13/00*
U.S. Cl. 311—39.1 **15 Claims**



1. A card recovery method in a card issuing apparatus, said card issuing apparatus comprising: an embosser for embossing an identification pattern on a card to be issued; an information reader for reading an information of the card embossed; and a controller for determining whether the card has an error according to said information of the card, said card recovery method comprising steps of:

feeding a card which has caused an error to said embosser;

identifying an error identification pattern; and

embossing said error identification pattern on the card which has caused an error.

6,039,413
COMPACT DISK BOX CAPABLE OF AUTOMATICALLY EXTENDING AND RETRACTING COMPACT DISKS

Ted Ju, No. 15, Wu Shiunn St., An Leh District, Keelung City, Taiwan

Filed Mar. 30, 1999, Appl. No. 281,444
Int. Cl.[7] A47B *63/06*
U.S. Cl. 312—9.15 **7 Claims**

1. A compact disk box structure capable of automatically extending compact disks mainly comprising a compact disk box body, a push plate, a front lid, a plurality of push rods, and a back lid and completed with a switch mechanism; in which said box body has an open rear end and is provided with slide guide grooves on two sides of the top face thereof, a row of parallel elongated openings on the rear portion of the top face, a longitudinal groove on the central portion of the top face and extending from the front end to the rear end, a row of spaced partition ribs formed on the inner wall surface of the top and the bottom of the box body, a row of long slots disposed on a front wall of the box body, two axle holes individually arranged on two side walls near the elongated slots to allow an axle rod to pass through; said push plate has a guide bar arranged on two sides thereof, a push button hole at the center of the front edge, one or more one-way stoppers transversely disposed on the central portion of the bottom face, a plurality of protrusions and a detent block; said front lid is provided with a plurality of rails, two hook-shaped tabs respectively disposed on a position near two ends of the front edge of the inner wall, and two short pins individually arranged on the outer walls near two ends of the lower edge; said push rod has a curved rod body with an axle hole on the upper end thereof; said back lid is provided with a plurality of embossed dots on two side walls; and characterized in that a plurality of said push rods are arranged in sequence in the elongated openings on the top face of the box body with an axle rod extending through the axle holes on the two side walls of the box body and the axle holes of the push rods so that each push rod is rotatably seated between two adjacent partition ribs of the box body and said front lid is pivoted to the front end wall of the box body and can freely turn to open or be secured in position by means of the switch mechanism and said back lid is attached to the rear end of the box body to close the rear end opening.

6,039,414
MODULAR ELECTRONIC ENCLOSURE HAVING ROTATIONAL MOLDED PLASTIC INTERLOCKING COMPONENTS

Marcus L. Melane, Irving; Michael J. Pisterzi, Plano; Edward G. Mills, Prosper, and Curtis L. Hargroves, Double Oak, all of Tex., assignors to Alcatel USA Sourcing, L.P., Plano, Tex.

Filed Dec. 11, 1998, Appl. No. 209,693
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A47B *45/00*
U.S. Cl. 312—205 **8 Claims**

1. A modular enclosure comprising:

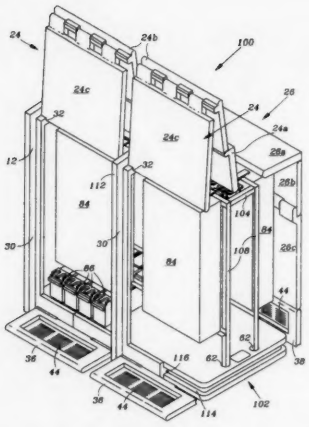
a base having a front wall, a rear wall, and spaced apart first and second end walls, spaced apart a distance;

a first side wall interconnected to said base rear wall and said base front wall;

a second side wall interconnected to said base rear wall and said base front wall, and spaced apart a distance from said first side wall;

a top connected to said side walls;

means for selectively expanding said distance between said first and second side walls for increasing the size of the enclosure while utilizing said first and second side walls said expanding means including a support disposed between said first and second side walls and interconnected to said base rear wall and said base front wall and said top;



a door disposed between said first side wall and said support adjacent said base front wall;

a door disposed between said second side wall and said support adjacent said base front wall;

a wall disposed between said first side wall and said support adjacent said base rear wall;

a wall disposed between said second side wall and said support adjacent said base rear wall; and

said base disposed between said first and second side walls and interconnected to said support.

6,039,415

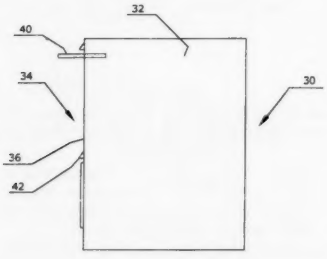
WATER RESISTANT FILE CABINETS

Anders Bruun, 239 Aubert Street, Winnipeg Manitoba, Canada, R2H 3G8

Filed Mar. 4, 1998, Appl. No. 34,240

Int. Cl.[7] A47B *81/00*

U.S. Cl. 312—229 **6 Claims**



1. A filing cabinet comprising:

a housing with at least one compartment having a substantially open front side;

at least one door mounted on the housing for sliding and pivoting movement between an open position extending into the cabinet at the top of the compartment and a closed position extending across the open front side of the compartment;

a water deflector extending across the cabinet immediately above the open front side of the compartment and immediately above the door, said water deflector having a top face sloping downwardly and forwardly from the front side of the compartment and beyond the door when the door is in the closed position, whereby water falling on the cabinet is deflected away from the front panel of the drawer; and

flanges projecting from edges of the compartment overlapping adjacent faces of the door in the closed position of the door whereby water is prevented from entering the open front side of the compartment.

6,039,416

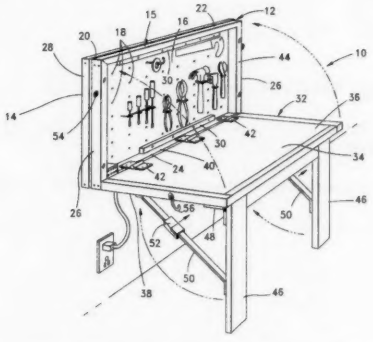
WALL MOUNTED PIVOTING WORK BENCH

Jeffrey W. Lambert, 1571 Greyson Ridge, Marietta, Ga. 30062

Filed Mar. 8, 1999, Appl. No. 262,888

Int. Cl.[7] A47F *5/08*

U.S. Cl. 312—245 **7 Claims**



1. A pivotal work bench for mounting to an essentially vertical wall, said work bench comprising:

a.) a generally rectangular member to be secured to said wall and comprising a peg-board having an array of apertures for receiving plural tool mounting fixtures, a rectangular framed structure extending from a first side of said peg-board, and a spacer member attached to a second side of said peg-board for contacting said wall, whereby to allow for the easy attachment of said fixtures; and,

b.) a second, generally rectangular work bench member hingedly secured to said rectangular structure, said work bench member movable from an operable work supporting position to an inoperable position in spaced relationship to said peg-board in latching engagement with said peripheral structures said work bench member further including a pair of hingedly mounted legs, each said leg having a lockable hinge support, where said hinge support comprises an overriding sleeve member to temporarily secure said legs in supporting relationship to said operable work bench member.

6,039,417

EASY TO ASSEMBLE STORAGE UNIT

Steven R. Snoke, Batavia; Gary Silvis, and Thomas E. Howland, both of Georgetown, all of Ohio, assignors to The Stanley Works, New Britain, Conn.

Continuation of application No. 08/391,211, Feb. 21, 1995, Pat. No. 5,645,332. This application Mar. 10, 1997, Appl. No. 815,317.

This patent is subject to a terminal disclaimer.

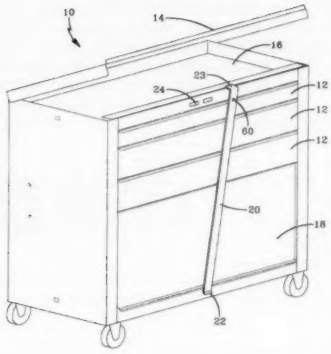
Int. Cl.[7] A47B *43/00*

U.S. Cl. 312—257.1 **18 Claims**

1. A storage container, comprising:

a first wall member having a right wall portion, a right back wall portion and a top edge;

a second wall member having a left wall portion oppositely disposed from said right wall portion of said first wall member, a left back wall portion adapted to be adjoined to said right back wall portion of said first wall member to form a back wall and a top edge;



a top wall adapted to be connected to said right wall portion, said right back wall portion, said left wall portion, and said left back wall portion, wherein a portion of said top wall is located adjacent with said top edges of said first and second wall members;

a lid adapted to be hinged to said first and second wall members, said lid adapted to cover said top wall; and

a floor panel oppositely disposed from said top wall, wherein said floor panel is adapted to be connected to said right wall portion, said right back wall portion, said left wall portion, and said left back wall portion.

6,039,418

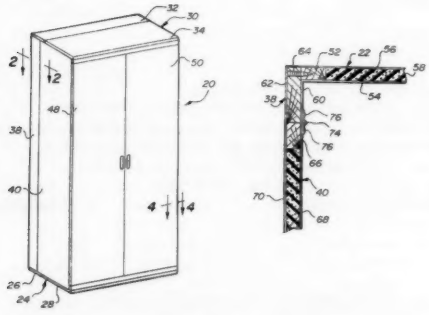
FOLDING WARDROBE

Jackie K. Thomas, Vernon, Ala., assignor to Omni International, Inc., Vernon, Ala.

Filed Nov. 3, 1998, Appl. No. 185,187

Int. Cl.[7] A47B *43/00*

U.S. Cl. 312—258 **1 Claim**



1. A folding wardrobe comprising:

a back panel having front and back faces, a bottom edge, top edge and left and right side edges;

a rear bottom panel, a rear top panel, a rear left side panel and a rear right side panel each fixed to the back panel along the bottom, top, left and right side edges thereof and extending forward from said front face;

a front bottom panel, front top panel, front left side panel and front right side panel each rotatably coupled to a front edge of the rear bottom panel, rear top panel, rear left side panel and rear right side panel respectively for rotation between stowed positions overlying the back panel and use positions extending forwardly from said rear bottom panel, rear top panel, rear left side panel and rear right side panel, respectively, and extending generally planar thereto forming bottom, top and left and right side walls, wherein the rear bottom and the rear top panels each extend forward from the front face of the back panel a greater distance than the rear right and rear left side panels whereby when the front bottom panel, front top panel, front left side panel and front right side panel are in their stowed positions, the front bottom panel and the front top panel overlie the front left side panel and the front right side panel, identical left and right doors coupled to front edges of the front left and right side panels for rotation between stowed positions along an exterior face of said front left and right side panels and closed use positions extending toward one another from the front left and right side panels to close an interior space; and

removable fasteners coupling the front bottom panel and the front top panel to the front left and front right side panels when the panels are in their respective use positions to prevent rotation of the front bottom, front top and front left and right side panels from the use positions, the panels thereby defining an interior space when the front bottom, front top and front left and right side panels are in the use positions,

a shelf and shelf brackets attached to the rear and front left and right side panels for supporting the shelf,

said front left and right side panels are constructed of wood frames about the peripheries thereof with a lightweight filler therein and a decorative cover thereon and the wood frame includes a cross member to which said shelf brackets are attached.

6,039,419

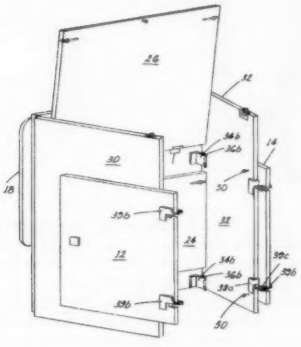
FOLDABLE READY-TO-USE ENTERTAINMENT STAND

Charles R. Brown; Marion O. Fogle, and Thomas F. Salley, all of Orangeburg, S.C., assignors to Decolam, Inc., Orangeburg, S.C.

Continuation-in-part of application No. 08/754,887, Nov. 22, 1996, Pat. No. 5,769,514, and a continuation-in-part of application No. 08/885,296, Jun. 27, 1997, Pat. No. 5,882,098. This application Mar. 26, 1998, Appl. No. 48,512.

Int. Cl.[7] A47B *43/00*

U.S. Cl. 312—262 **25 Claims**



23. A foldable, ready-to-use entertainment stand having a folded and unfolded configuration comprising:

a back panel;

a top pivotally attached to said back panel;

first and second side panels pivotally attached to said back panel for supporting said top;

a horizontal shelf spaced below said top, and hinges secured with said horizontal shelf and said back panel pivotally attaching said horizontal shelf to said back panel;

first and second front doors carried by said first and second side panels, respectively, for enclosing an interior space of said entertainment stand;

first and second displacement hinges secured to said back panel and said first and second side panels pivotally attaching said

first and second side panels to said back panel in spaced apart manner defining a storage space when said first and second side panels are folded about said first and second displacement hinges when said stand is in said folded configuration;

said horizontal shelf being disposed in said storage space when folded to a generally flush configuration with said back panel when said stand is in said folded configuration;

rearwardly pivoting top hinge means attaching said top to said back panel so that said top panel may be pivoted rearwardly to a generally flush position with said back panel when said stand is in said folded configuration; and

flush door hinge means pivotally attaching said first and second front doors to said first and second side panels so that said first and second front doors may be folded generally flush with said first and second side panels, respectively, when said stand is in said folded configuration.

6,039,420

FRAME FOR A SWITCHGEAR CABINET

Horst Besserer, Herborn; Marc Hartel, Reiskirchen, and Jürgen Zachrai, Dillenburg, all of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Herborn, Germany

PCT No. PCT/EP95/03959, § 371 Date Oct. 9, 1996, § 102(e) Date Oct. 9, 1996, PCT Pub. No. WO96/14679, PCT Pub. Date May 17, 1996

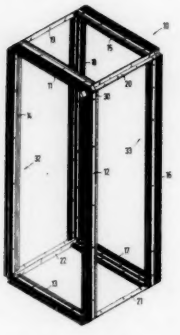
PCT Filed Oct. 7, 1995, Appl. No. 718,548

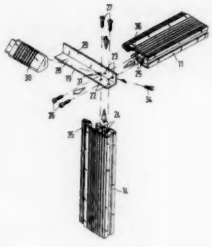
Claims priority, application Germany, Nov. 5, 1994, 44 39 628

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A47B *47/00*

U.S. Cl. 312—265.1 **17 Claims**





1. In a rack having horizontal frame legs and vertical frame legs forming a front frame and a rear frame, wherein the frames are connected with each other by depth struts in corner areas of the frames, the improvement comprising:

the horizontal frame legs (**11**–**14**) and the vertical frame legs (**15**–**18**) of the front frame (**32**) and the rear frame (**33**) each formed as an extruded profiled section with a continuous fastening groove (**35**, **36**) and two continuous screw sockets (**24**, **25**);

the depth struts (**19**, **20**, **21**, **22**) formed as L-shaped profiled sections with two plate-shaped legs (**28**, **29**), each of the depth struts (**19**, **20**, **21**, **22**) extending entirely between the front frame (**32**) and the rear frame; and

the frame legs (**11**, **12**; **12**, **13**; **13**, **14** or **15**, **16**; **16**, **17**; **17**, **18**; **18**, **15**) meeting each other at the corner areas bolted together with the plate-shaped legs (**28**, **29**) of the depth struts (**19** to **22**) by fastening screws (**26**, **27**); and

a plurality of corresponding corner pieces (**30**) covering the depth struts (**19** to **22**) at the corner areas, and each of the corner pieces (**30**) having a triangular cross section and filling a space between the plate-shaped legs (**28**, **29**) of the depth struts (**19** to **22**).

6,039,421

PULL-OUT DEVICE

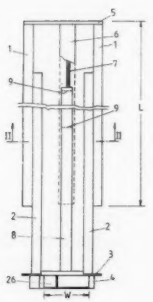
Manfred Fulterer, Lustenau, Austria, assignor to Fulterer Gesellschaft m.b.H., Lustenau, Austria

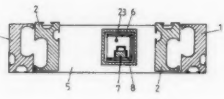
Filed Mar. 12, 1999, Appl. No. 267,332

Claims priority, application Austria, Mar. 12, 1998, 441/98

Int. Cl.[7] A47B *88/00;* **B60P** *1/00*

U.S. Cl. 312—333 **19 Claims**





1. A pull-out device, comprising at least one carcass rail and at least one pull-out rail, the carcass and pull-out rails forming together a rail pair; and a blocking device for retaining the carcass and pull-out rails in a respective relative position of the carcass rail and the pull-out rail, the blocking device having at least one stationary tooth rack which extends parallel to the carcass and pull-out rails, a tooth segment operatively connected with the at least one pull-out rail and engageable with the tooth rack for blocking displacement of the at least one pull-out rail relative to the carcass rail, a first box-shaped rail having a rear end thereof connected with the at least one carcass rail, and a second profiled rail telescopically displaceable in the box-shaped rail and having a front end thereof connected with the at least one pull-out rail, both the tooth rack and the tooth segment being located within the second rail, with the tooth segment being arranged in a rear section of the second rail.

6,039,422

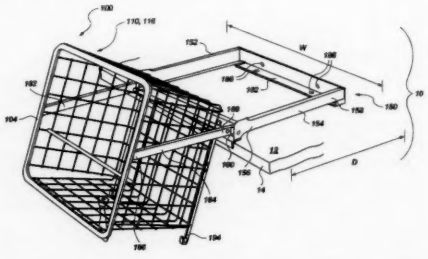
SLIDING AND TILTING SHELF DRAWER

Rex A. Butters, 1260 Cook St., Ogden, Utah 84404, and Scott W. Butters, 1054 Deborah Dr., Bountiful, Utah 84010

Filed Aug. 1, 1997, Appl. No. 905,289

Int. Cl.[7] A47B *88/06*

U.S. Cl. 312—334.1 **12 Claims**



1. A device for organizing and storing various articles, said device being adapted for disposition in a space having a horizontal surface having a front edge having a substantially vertical surface, said device comprising:

a base member disposed on said horizontal surface, said base member having first and second tracks, each track having a

forward end, and a forward member extending between said tracks and holding said tracks together in a parallel configuration;

first and second slide members each slidingly disposed in one of said tracks, said slide members sliding between an accessible position and a storage position;

a compartment pivotally attached to said slide members, said compartment pivoting between an upright position and a tilted position; and

a lip formed on said forward member, said lip adapted for abutting said substantially vertical surface of said front edge of said horizontal surface for correctly positioning said base member and compartment with respect to said vertical surface such that said slide member slides said compartment between said accessible position and said storage position along a substantially perpendicular path with respect to said front edge of said horizontal surface.

6,039,423

PULL-OUT DEVICE FOR A TALL CUPBOARD

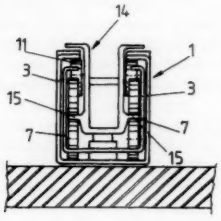
Manfred Fulterer, Lustenau, Austria, assignor to Fulterer Gesellschaft m.b.H., Lustenau, Austria

Filed Sep. 1, 1998, Appl. No. 145,394

Claims priority, application Austria, Sep. 3, 1997, 1474/97; Dec. 30, 1997, 2199/97

Int. Cl.[7] **A47B** *88/00*

U.S. Cl. 312—334.29 **6 Claims**



1. A pull-out device for a tall cupboard, comprising:

a U-shaped carcass rail having opposite cheeks provided at upper edges thereof with inwardly bent flanges which serve as running tracks;

an intermediate rail received in the carcass rail and having opposite cheeks and a plurality of support and running rollers having axles thereof lying in different horizontal planes, with one support roller of the plurality of support rollers being provided in an upper rear portion of each cheek of the intermediate rail and displaceable along the running track defined by a respective flange of the carcass rail, and with at least one running roller of a plurality of running rollers being provided in a middle region of a longitudinal extent of each cheek of the intermediate rail and supported with a radial clearance; and

a pull-out rail having opposite horizontal flanges supported by the running rollers, wherein the flanges of the carcass rail which serve as running tracks, are inclined, from a rear end of the carcass rail, at least along a portion of their longitudinal extent toward a front end of the carcass rail.

6,039,424

MULTIPLE HEIGHT PACKAGE RETAINER

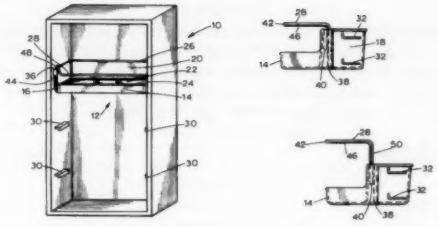
John J. Pink, Cedar Rapids, Iowa, assignor to Amana Company, L.P., Amana, Iowa

Filed May 21, 1997, Appl. No. 859,977

Int. Cl.[7] **A47B** *96/04;* **A47F** *5/00*

U.S. Cl. 312—405.1 **19 Claims**

1. A multiple height package retainer for a refrigerator door, comprising:



a shelf having a shelf front, shelf floor, and first and second ends, the shelf being arranged to support at least one package to be retained;

a single barrier having first and second ends, the barrier being associated with the shelf and having first and second heights with respect to the shelf floor;

first and second holes disposed substantially perpendicular to the shelf floor at the first end of the shelf, the first and second holes each having a depth, the depth of the first and second holes being different, one of the holes receiving the first end of the barrier and, with the first end of the barrier being received within the first hole, the barrier has the first height, and with the first end of the barrier being received within the second hole, the barrier has the second height, the first height being less than the second height;

at least the first hole having a longitudinal axis the longitudinal axis being disposed substantially perpendicular to the shelf floor; and

at least one hole at the second end of the shelf to receive the second end of the barrier.

6,039,425

INK JET RECORDING METHOD AND HEAD

Takuro Sekiya, Yokohama, and Kyuhachiro Iwasaki, Fujisawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of application No. 08/480,148, Jun. 7, 1995, Pat. No. 5,657,060, which is a continuation of application No. 08/127,951, Sep. 27, 1993, Pat. No. 5,610,637. This application Mar. 19, 1997, Appl. No. 820,763.

Claims priority, application Japan, Sep. 29, 1992, 4-259521; Feb. 17, 1993, 5-28019; May 7, 1993, 5-106706

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B41J** *2/04;2/015*

U.S. Cl. 347—15 **5 Claims**

1. An ink jet recording apparatus for jetting ink droplet to a recording medium and forming a dot image on said recording medium, said jet recording apparatus comprising:

ink jet orifices from which ink droplets are jetted;

ink spaces which are filled with ink and connected to said ink jetting orifices;

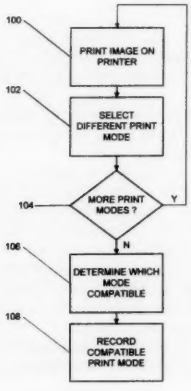
energy applying portions for applying energy to the ink in said ink spaces on demand so that ink droplets are jetted from said ink jetting orifices by the applied energy; and

control means for controlling said energy applying portions in accordance with image information representing an image to be formed on said recording medium so that the image includes pixels each of which is formed of one or a plurality of ink droplets, a maximum number of ink droplets for each pixel being controlled so as to be less than ten, wherein an amount of ink for each pixel formed of one or a plurality of ink droplets is equal to or less than 1.405×10^{-7} grams.

6,039,426
SIMPLIFIED PRINT MODE SELECTION METHOD AND APPARATUS

Michael D Dobbs, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 9, 1996, Appl. No. 694,944
Int. Cl.[7] B41J *29/393*
U.S. Cl. 347—19 **6 Claims**



1. A computer-assisted method for selecting a print mode on an ink-jet printer that is compatible with a user-selected print medium, wherein the printer has a set of two or more available print modes, the method comprising the steps of:

ink-jet printing a predefined image on the user-selected print medium in a first predefined location using a first available print mode;

automatically selecting a second available print mode of the ink-jet printer, wherein the second available print mode is a different one of the available print modes in the set than the first available print mode, and is not identical to the first available print mode;

automatically printing the predefined image on the user-selected print medium in a second predefined location different from the first predefined location and using the second available print mode, thereby to produce at least a second predefined image that is differentiated from such first predefined image by print mode;

reviewing the first and second predefined images on the recording medium to determine which print mode is more compatible with the medium, wherein said step is performed by the user visually inspecting the first and second predefined images on the medium and comparing the images to determine a relative quality contrast therebetween; and

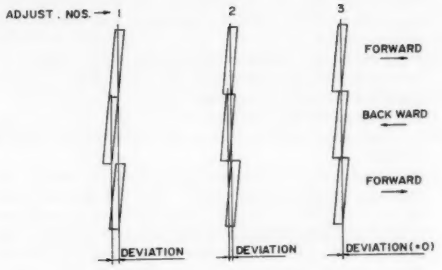
recording the more compatible print mode for use in further ink-jet printing on the user-selected medium.

6,039,427
RECORDING APPARATUS HAVING DEVIATION ADJUSTING MECHANISM

Yuji Kanome, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/262,841, Jun. 21, 1994, abandoned. This application Jun. 2, 1997, Appl. No. 867,390. Claims priority, application Japan, Jun. 22, 1993, 5-150637
Int. Cl.[7] B45J *29/393*
U.S. Cl. 347—19 **17 Claims**

1. A recording apparatus for printing on a recording medium by reciprocating a recording head having a linear array of recording



elements along a main scanning direction to allow printing during both forward and backward scans of the recording head and effecting relative movement between the recording head and the recording medium in a subscanning direction between scans of the recording head in the main scanning direction, comprising:

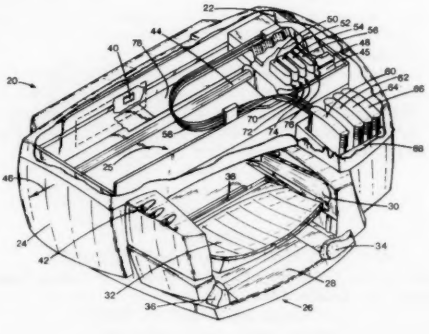
means for causing the recording head to print a plurality of adjustment patterns extending in a direction substantially perpendicular to the main scanning direction by causing the recording head to print consecutive parts of each adjustment pattern in consecutive forward and backward scans of the recording head in the main scanning direction so that each adjustment pattern comprises three parts with the middle of the three parts being printed during scanning of the recording head in a direction opposite of that for the other two parts and with driving timings of the recording elements being selected so that different adjustment patterns have different degrees of misalignment in the main scanning direction between the middle part and the other two parts of the adjustment pattern; and

means for controlling the drive timings of the recording elements during recording of an image based on the adjustment pattern which most closely resembles a straight line in the subscanning direction.

6,039,428
METHOD FOR IMPROVING INK JET PRINTER RELIABILITY IN THE PRESENCE OF INK SHORTS

Ronald A Juve, Brush Prairie, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 13, 1998, Appl. No. 78,394
Int. Cl.[7] B41J *29/393*
U.S. Cl. 347—19 **24 Claims**



1. An apparatus for improving the reliability of an ink jet printer comprising:

a plurality of pens;

a power supply line coupled to each of said plurality of pens through at least one power supply contact;

a ground line coupled to each of said plurality of pens through at least one ground contact;

a printer controller;

a plurality of data lines coupled between said plurality of pens and said printer controller for carrying data from said printer controller to each of said pens;

a plurality of line drivers interposed between said printer controller and each of said data lines;

a set of isolation resistors interposed between each of said line drivers and each of said pens to resistively isolate each of said data lines from ink shorts developed at said pens; and

an ink short detector coupled to each of said pens and to said printer controller wherein said ink short detector generates an alarm signal responsive to said ink shorts and said printer controller adaptively re-maps said data responsive to said alarm signal.

6,039,429

MISPRINT DETECTION TECHNIQUES

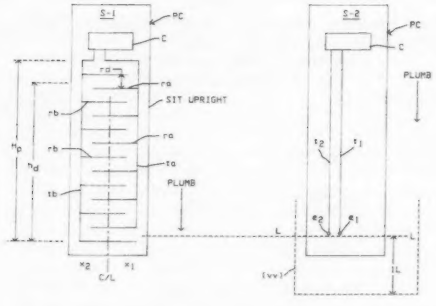
Andrew J. Balousek, Berkeley, Mich., assignor to Unisys Corporation, Blue Bell, Pa.

Division of application No. 08/760,012, Dec. 3, 1996, Pat. No. 5,801,723, which is a division of application No. 08/265,054, Jun. 24, 1994, Pat. No. 5,583,546. This application Aug. 23, 1998, Appl. No. 145,779.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B41J *2/20*

U.S. Cl. 347—19 **19 Claims**



12. Apparatus for detecting an erroneous printing condition, the apparatus comprising:

a substrate having at least one surface;

a first conductive trace disposed on the surface;

a second conductive trace disposed on the surface, the second conductive trace being electrically isolated from the first conductive trace;

means for applying a voltage potential between the first conductive trace and the second conductive trace;

means for directing conductive ink against the surface of the substrate to form a conductive path between the first conductive trace and the second conductive trace during the erroneous printing condition; and

means for detecting the conductive path to indicate the erroneous printing condition.

6,039,430

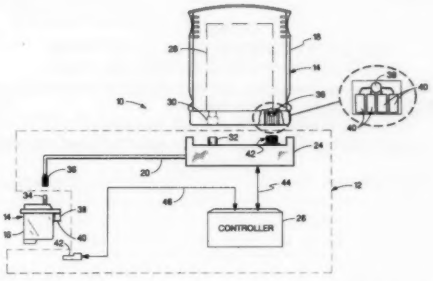
METHOD AND APPARATUS FOR STORING AND RETRIEVING INFORMATION ON A REPLACEABLE PRINTING COMPONENT

Brian L. Helterline, Salem, Oreg.; Michael L. Bullock, and Winthrop D. Childers, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of application No. 09/092,111, Jun. 5, 1998. This application Sep. 3, 1998, Appl. No. 148,039.

Int. Cl.[7] B41J *29/393*

U.S. Cl. 347—19 **22 Claims**



1. A replaceable printer component for use in an ink jet printing system, the ink jet printing system having a control portion for controlling operation of the printing system, the replaceable printer component including:

a linking portion connectable to the control portion for transferring information between the replaceable printer component and ink jet printing system; and

a storage device coupled to the linking portion, the storage device configured to interact with the control portion to receive information from the control portion, wherein the information the storage device receives from the control portion is not directly related to the operation of the printing system.

6,039,431

PRINTER HEAD CLEANING DEVICE FOR INK JET PRINTER

Yasuji Yui, Kanagawa, and Toshiki Kagami, Tokyo, both of Japan, assignors to Sony Corporation, Japan

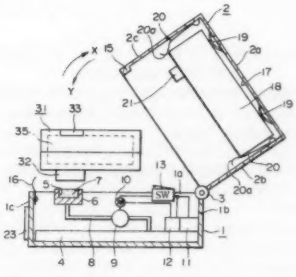
PCT No. PCT/JP97/00590, § 371 Date Oct. 29, 1997, § 102(e) Date Oct. 29, 1997, PCT Pub. No. WO97/31780, PCT Pub. Date Sep. 4, 1997

PCT Filed Feb. 27, 1997, Appl. No. 945,542

Claims priority, application Japan, Feb. 29, 1996, P8-043557

Int. Cl.[7] B41J *2/165*

U.S. Cl. 347—30 **6 Claims**



1. A printer head cleaning device for an ink jet printer comprising:

a case body;

a receiving portion provided at the case body and adapted for receiving a printer head; and

a sucking portion, also provided at said case body and attached to said receiving portion, adapted for carrying out suction of ink from the printer head received at the receiving portion;

wherein the device further comprises a cover body rotatably provided at the case body, and an insertion portion also provided at the cover body and inserted into a receiving hole of the printer head.

6,039,432

INK JET RECORDING APPARATUS WITH RECOVERING DEVICE OF INK JET HEAD

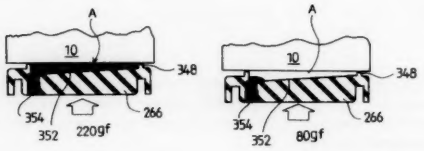
Mutsuo Fukuoka, Ama-gun, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 12, 1996, Appl. No. 695,633

Claims priority, application Japan, Aug. 24, 1995, 7-240708

Int. Cl.[7] B41J *2/165*

U.S. Cl. 347—32 **23 Claims**



1. An ink jet recording apparatus including an inkjet head for ejecting ink droplets from nozzles onto a recording medium, a cap made of deformable material for covering the ink jet head and suction means for sucking the ink to recover ink jetting condition of the ink jet head by adding a negative pressure to the cap, the ink jet recording apparatus comprising:

pressing means for contacting the cap with the ink jet head; and

control means for controlling a contact force by the pressing means, through which the cap is contacted with the ink jet head, the control means controlling the contact during at least two continuous positions, the at least two continuous positions including a first position and a second position occurring after the first position;

wherein the contact force corresponding to the first position has a first strength that the cap is isolated from atmosphere when the negative pressure is added to the cap by the suction means; and

wherein the contact force corresponding to the second position has a second strength different from the first strength such that the cap is partially deformed and communicated with atmosphere when the negative pressure is added to the cap by the suction means.

6,039,433

INK JET RECORDING APPARATUS AND CONTROL METHOD THEREOF

Hideyuki Kobayashi; Mitsuru Kishimoto; Noboru Ooishi, and Kiyoshi Ikeda, all of Tokyo, Japan, assignors to Oki Data Corporation, Tokyo, Japan

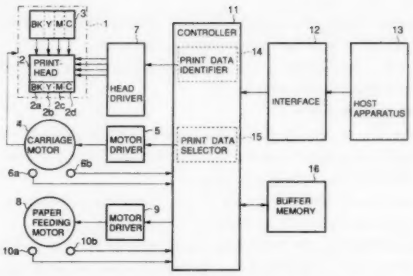
Filed Aug. 26, 1997, Appl. No. 917,375

Claims priority, application Japan, Aug. 28, 1996, 8-245548

Int. Cl.[7] B41J *2/145;2/15;29/38*

U.S. Cl. 347—40 **19 Claims**

1. An ink jet recording apparatus wherein a printhead includes a plurality of ink-ejecting elements by which black ink drops and ink drops of different colors are ejected to a recording medium in accordance with print data when the printhead is moved relative to a recording medium in first and second directions perpendicular to a direction in which the recording medium feeds, the first and second directions being opposite to each other, the plurality of



ink-ejecting elements being aligned in a predetermined order in the first direction, wherein each of the plurality of ink-ejecting elements ejects ink drops of a corresponding one of black ink and colored inks, the colored inks including inks of at least three different colors, the ink jet recording apparatus comprising:

a print data identifier, separating the print data for a line into black print data indicative of printing black dots by ejecting black ink on the recording medium and color print data indicative of printing colored dots by ejecting colored inks on the recording medium; and

a print data selector, providing only the black print data to the printhead to cause the printhead to eject black ink drops when the printhead is moved relative to the recording medium in the first direction, and providing either only the color print data to the printhead to cause the printhead to eject colored ink drops or only the black print data to the printhead to cause the printhead to eject black ink drops, when the printhead is moved relative to the recording medium in the second direction.

6,039,434

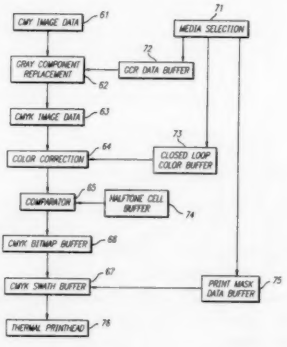
THRESHOLDED UNDERCOLOR REMOVAL AND BLACK REPLACEMENT IN A THERMAL-INKJET PRINTER OR PLOTTER

Nathan Moroney, Barcelona, Spain, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1997, Appl. No. 810,752

Int. Cl.[7] B41J *2/21;2/145;2/15*

U.S. Cl. 347—43 **19 Claims**



1. Apparatus for printing images on a printing medium by scanning inkjet printheads; said apparatus comprising:

automatic means for receiving image data expressed as signals for at least chromatic colors;

automatic means for determining a quantity of undercolor, if any, in the image;

automatic means for reducing the chromatic-color signals and adding a signal for black, in amounts nonlinearly related to the quantity of undercolor;

means for holding such printheads and translating such printheads across such printing medium; and

automatic means for applying the reduced and added signals to control printing by such printheads;

wherein said reducing and adding means cooperate with said applying means to produce total undercolor inking that is a substantially monotonic function of the quantity of undercolor.

6,039,435

IMAGE FORMING APPARATUS WITH RESTRUCTURED IMAGE DATA

Shirou Wakahara, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1998, Appl. No. 145,004
Claims priority, application Japan, Sep. 9, 1997, 9-244329
Int. Cl.[7] B41J *2/04*
U.S. Cl. 347—55 **11 Claims**

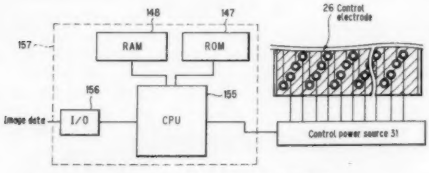


Image forming control unit configuration

1. An image forming apparatus at least comprising:

a supplying means having a developer support carrying a developer;

an opposing electrode disposed facing the developer support;

a high-voltage power source for supplying a high voltage to produce a potential difference between the developer support and the opposing electrode;

a control electrode at least comprising:

an insulative substrate disposed between the developer support and the opposing electrode;

a plurality of gates formed in the insulative substrate for forming a passage of the developer;

one or more electrode groups provided covering a multiple number of the gates; and

a control means for applying multiple potential states to each electrode group of the control electrode, wherein the control means controls the passage of the developer through the multiple number of the gates by applying a designated voltage to the electrode groups so as to form an image on a surface of a recording medium which is being conveyed over the opposing electrode, characterized in that, when a value as to a certain image-quality indicator for a first image, which is an ideal image to be formed on the recording medium surface, differs from a value as to an image-quality indicator for a second image, which is a predicted image to be formed on the recording medium surface, beyond a predetermined range, the control means restructures image data so that a desired image is obtained,

wherein the image forming apparatus further includes a memory and the ideal image and the predicted image are formed in the memory using the image data, the ideal image being formed when the developer passes through the multiple number of the gates in an ideal manner and the predicted image being formed when the developer passes through the multiple number of the gates in a predicted manner,

wherein the control means, at least, performs control of an arbitrary gate of the multiple number of the gates so as to cause the developer to transfer toner through the arbitrary gate in three different ways: a first type transfer in which the passage of the developer through the arbitrary gate will not be affected by a previous passage of the developer through the arbitrary gate; a second type transfer which occurs after the developer transfer of the first type and in which the passage of the developer is affected by the first type transfer; and a third type transfer which occurs after the developer transfer of the first and the second types and in which the passage of the developer is affected by the second type transfer, and the control means further comprises an image processing means for restructuring the image data so that the desired image can be formed, by taking advantage of at least one of a plurality of characteristics of the first, the second and the third transfer types, and

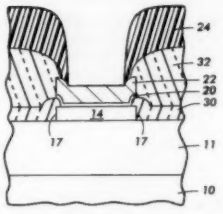
wherein the image processing means restructures the image data by at least complementing or thinning pixels of data which will be of a dot formed of toner transfer of the second or the third type.

6,039,436

THERMAL INK-JET PRINTHEAD WITH LATERAL THERMAL INSULATION FOR THE HEATING ELEMENTS

John R. Andrews, Fairport; Peter A. Torpey, Webster; Cathie J. Burke, Rochester, and Eduardo M. Freire, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 12, 1998, Appl. No. 41,305
Int. Cl.[7] B41J *2/05*
U.S. Cl. 347—62 **8 Claims**



1. A thermal ink-jet printhead comprising at least one ejector, the ejector comprising:

a structure defining a channel for passage of liquid ink therethrough;

a heating element, defining a substantially rectangular heating element area within the channel, the heating element area defining at least a first lateral edge and a second lateral edge, the first lateral edge and second lateral edge not having an electrode associated therewith, the heating element including a layer of polysilicon defining a thickness, the polysilicon being uniformly doped from the first lateral edge to the second lateral edge; and

a first insulator disposed along the first lateral edge and the second lateral edge, the insulator defining a thickness not less than the thickness of the heating element at the perimeter of the heating element area, a portion of the first insulator extending over a portion of the heating element.

6,039,437

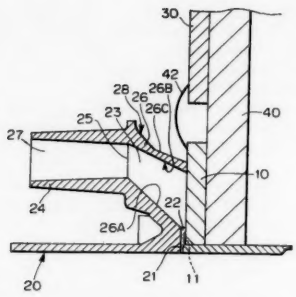
INK-JET HEAD AND INK-JET PRINTING APPARATUS INCORPORATING THE SAME

Akira Tsujimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1996, Appl. No. 592,179
Claims priority, application Japan, Jan. 31, 1995, 7-014014
Int. Cl.[7] B41J *2/05*
U.S. Cl. 347—63 **20 Claims**

1. An ink-jet head comprising:

a substrate having a plurality of ejection energy generating elements arranged thereon and a plurality of wirings for driving said elements, respectively, and a connecting portion for electrically connecting said wirings at a rear end portion thereof;



an upper plate member fitted to said substrate and having a plurality of ink ejection openings, a plurality of nozzle portions which are part of a plurality of ink passages communicated with said ink ejection openings, a recessed portion comprising at least one common liquid chamber communicated with said nozzle portions, and an opening portion communicated with said recessed portion, said common liquid chamber having a first inner side surface extending from the ink ejection opening side to the opening portion and a second inner side surface extending from the side opposite to the ink election opening side to the opening portion; and

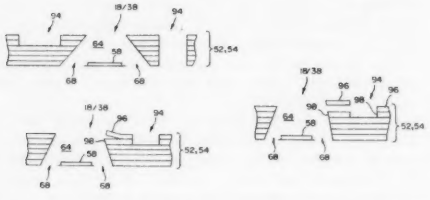
wherein the first inner side surface of said common liquid chamber is tilted in a direction opposite to an ink ejecting direction, the second inner side surface of said common liquid chamber is tilted in a same direction as said first inner side surface, and a tilting angle of the second inner side surface is greater than a tilting angle of the first inner side surface.

6,039,438

LIMITING PROPAGATION OF THIN FILM FAILURES IN AN INKJET PRINTHEAD

Tim Beerling, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 21, 1997, Appl. No. 955,193
Int. Cl.[7] B41J *2/05*
U.S. Cl. 347—63 **20 Claims**



1. An inkjet pen for ejecting ink droplets onto a print medium, said pen comprising:

an inkjet printhead and a surface to which the inkjet printhead is coupled;

the inkjet printhead comprising a substrate and a plurality of layers and having a plurality of printing elements formed in the plurality of layers, the plurality of layers overlaying the substrate, wherein each one printing element of said plurality of printing elements comprises:

(a) a resistive element for heating ink to generate said ink droplets, the resistive element formed in a conductive layer of said plurality of layers;

(b) a firing chamber having a base supporting said resistive element, the firing chamber defined by a chamber wall, the wall formed by one or more layers of said plurality of layers;

(c) an ink feed channel for supplying ink to said firing chamber through a firing chamber entrance; and

(d) a nozzle in communication with the firing chamber through which ink droplets are ejected, the nozzle having a nozzle opening occurring in at least an outermost layer of the plurality of layers, said outermost layer being furthest of the plurality of layers from the substrate;

wherein said nozzle opening from respective ones of said plurality of printing elements together form a plurality of nozzle openings,

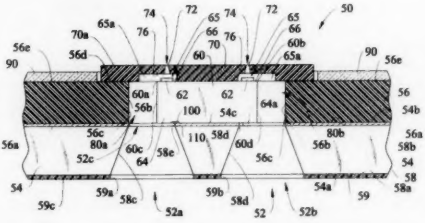
wherein respective non-plugged openings are formed in at least said outermost layer of said plurality of layers in regions of the printhead between respective nozzle openings of said plurality of nozzle openings.

6,039,439

INK JET HEATER CHIP MODULE

Steven Robert Komplin; Ashok Murthy, both of Lexington, and Carl Edmond Sullivan, Versailles, all of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Jun. 19, 1998, Appl. No. 100,544
Int. Cl.[7] B41J *2/05*
U.S. Cl. 347—65 **9 Claims**



1. A heater chip module comprising:

a carrier adapted to be secured to a container for receiving ink;

a heater chip coupled to said carrier, said carrier including a support substrate having at least one passage which defines a path for ink to travel from the container to said heater chip, said support substrate being a silicon plate of thickness of from about 400 microns to about 2500 microns; said carrier including a spacer secured to said silicon plate and having a cavity in which said heater chip is located; and

a nozzle plate positioned adjacent to said heater chip.

6,039,440

INK-JET HEAD

Seiichi Osawa, Oyama, and Takeo Komiyama, Higashikurume, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

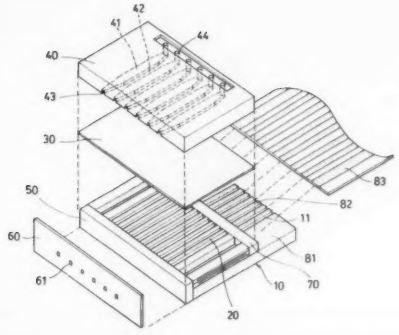
Division of application No. 08/714,077, filed as application No. PCT/JP95/00583, Mar. 28, 1995, Pat. No. 5,761,783. This application Nov. 18, 1997, Appl. No. 972,254.
Claims priority, application Japan, Mar. 29, 1994, 6-58423
Int. Cl.[7] B41J *2/045*
U.S. Cl. 347—70 **5 Claims**

1. An ink-jet head comprising:

an insulating base;

a plurality of juxtaposed multilayer piezoelectric elements each formed by alternately stacking first piezoelectric plates polarized in a first direction with regard to the thickness and second piezoelectric plates polarized in a second direction opposite to said first direction, with interposing conductive members and having first and second nondriven layers which are not distorted even when voltage is applied thereto and disposed at the opposite ends thereof with respect to the direction of stacking;

an elastically bendable oscillation plate; and



a flow passage plate provided with a plurality of ink outlets at the front end thereof, and a plurality of juxtaposed ink chambers connected to the ink outlets;

wherein the surface of the first nondriven layer of each multilayer piezoelectric element is bonded to the base, a first flat surface of the oscillation plate is bonded to the surfaces of the second nondriven layers of the multilayer piezoelectric elements, and the flow passage plate is bonded to a second flat surface of the oscillation plate with the ink chambers arranged in the direction of distortion of the multilayer piezoelectric elements, and

a front member made of a rigid material is bonded to the base, and a front end portion of the first flat surface of the oscillation plate is bonded to the front member to support the front end portion of the flow passage plate through the oscillation. plate, and

a back member made of a rigid material is bonded to the base and a back end portion of the first flat surface of the oscillation plate is bonded to the back member to support the front end portion of the flow passage plate through the oscillation plate by the front member.

6,039,441

INK JET RECORDING UNIT

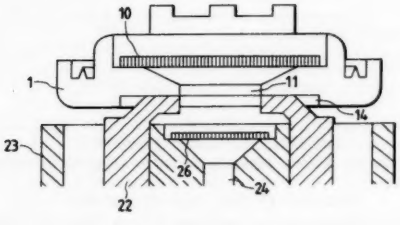
Ichiro Tomikawa; Mitsuhide Soga; Katsuyuki Fujii; Katsuhide Ogawa; Junichi Yoshida, all of Ebina; Shigeo Kawachi, and Takehiko Noda, both of Yao, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1996, Appl. No. 720,149

Claims priority, application Japan, Sep. 28, 1995, 7-250811; Sep. 28, 1995, 7-250812

Int. Cl.[7] B41J *2/175*

U.S. Cl. 347—86 **6 Claims**



1. An ink jet recording unit comprising:

a recording head with an ink ejecting means for ejecting ink, the recording head having a recording head ink passage;

an ink tank, detachably attached to said recording head along a common axis, for supplying ink to said recording head, the ink tank having an ink tank ink passage, the ink tank ink passage and the recording head ink passage defining the common axis and having an ink tank ink passage direction and a recording head ink passage direction;

an elastic jointing member, provided on said recording head, for jointing said recording head ink passage and said ink tank ink passage, said elastic jointing member including an umbrella-like portion having an opening formed at a top thereof and a space therein, wherein the space expands in the recording head ink passage direction of the common axis and the jointing portion forms a jointing ink passage connecting the ink tank ink passage and the recording head ink passage.

6,039,442

ELECTROSTATIC INK JET RECORDING DEVICE HAVING A STIRRING SYSTEM

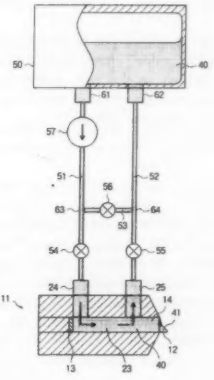
Yoshihiro Hagiwara; Junichi Suetsugu; Tadashi Mizoguchi; Hitoshi Minemoto; Hitoshi Takemoto; Kazuo Shima, and Toru Yakushiji, all of Niigata, Japan, assignors to NEC Corporation, Japan

Filed Dec. 23, 1997, Appl. No. 996,804

Claims priority, application Japan, Dec. 23, 1996, 8-348588

Int. Cl.[7] B41J *2/18*

U.S. Cl. 347—89 **7 Claims**



1. An electrostatic ink jet recording device, comprising:

an ink jet recording head defining an ink chamber having an ink ejection slit;

an ink reservoir operable to receive pigmented ink therein; and

a circulation section operable to circulate said pigmented ink between said ink chamber and said ink reservoir, said circulation section including:

a first tube having a first point and a second tube having a second point, said first and second tubes each coupled between said ink chamber and said ink reservoir,

a bypass tube coupled between said first point and said second point for bypassing said ink chamber, said bypass tube having a first valve therein,

a second valve disposed in said first tube between said ink chamber and said first point,

a third valve disposed in said second tube between said ink chamber and said second point, and

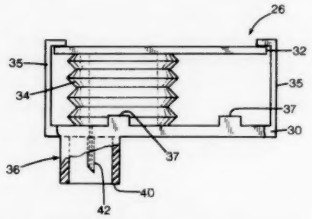
a pump disposed in said circulation section, said pump circulating the ink at least through said first and second tubes.

6,039,443

APPARATUS AND METHOD OF PRIMING INK SUPPLY TUBES IN AN INK JET PRINTER

Katherine Ann Dunphy, Lafayette, Ind.; Susan T Schnapp, Vancouver, Wash., and David C Johnson, Portland, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1997, Appl. No. 990,156
Int. Cl.[7] B41J *2/19*
U.S. Cl. 347—92 **16 Claims**



1. An ink jet printer comprising:

a body defining a paper path and having a carriage operable to reciprocate across the paper path;

an ink supply receptacle on the body and spaced apart from the carriage;

an ink conduit extending between the ink supply receptacle and the carriage;

a suction apparatus on the carriage defining an expandable chamber having an inlet connected to the conduit and operable between a collapsed position and an expanded position, such that ink may be drawn from an ink supply connected to the receptacle to displace at least some of the air from the conduit; and

wherein the carriage defines a pen receptacle including an electrical connection to printer circuitry, and wherein the suction apparatus is received in the pen receptacle, such that the suction apparatus must be removed from the carriage before a pen is installed in the pen receptacle.

6,039,444

RECORDING MATERIAL

Kenichi Mori; Katsuya Ito; Tooru Kotani; Toshitake Suzuki, and Yasushi Sasaki, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1998, Appl. No. 57,764
Claims priority, application Japan, May 30, 1997, 9-141915; May 30, 1997, 9-141916
Int. Cl.[7] B41M *5/00*
U.S. Cl. 347—105 **8 Claims**

1. A method of ink jet recording comprising ink jet recording on an ink-receiving layer of a recording material including a substrate and an ink-receiving layer formed thereon, the ink-receiving layer containing both a water-absorbing anionic polymer and a water-absorbing cationic polymer, wherein the water-absorbing anionic and cationic polymers are in the form of water-absorbing resin particles.

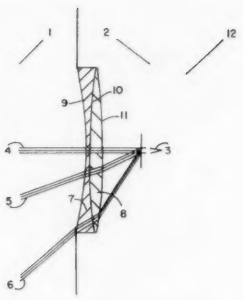
6,039,445

AFOCAL WATER-AIR LENS WITH GREATLY REDUCED LATERAL COLOR ABERRATION

Harold R. Suiter, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1998, Appl. No. 120,876
Int. Cl.[7] G02C *1/00;11/08;* **G02B** *9/00*
U.S. Cl. 351—43 **8 Claims**

1. An afocal lens arrangement configured as a protective barrier separating first and second mediums having two different indices



of refraction and dispersion values, said afocal lens arrangement comprising compensating means for reducing lateral chromatic aberration;

wherein said compensating means comprise:

(a) a first portion adjacent to said first medium and comprising a negative lens of relatively high dispersion value and having two concave sufaces; and,

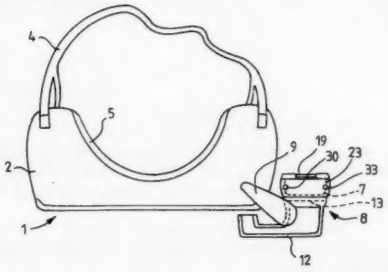
(b) a second portion adjacent said second medium and said first portion and comprising a positive lens of relatively low dispersion value and having two concave surfaces.

6,039,446

FACE SHIELD, INCORPORATING A WRIST WATCH DISPLAY

Ari Lähteenmäki, Helsinki, Finland, assignor to Suunto Oyj, Espoo, Finland

Filed Nov. 12, 1998, Appl. No. 191,285
Claims priority, application Finland, Nov. 28, 1997, 974367
Int. Cl.[7] G02C *1/00*
U.S. Cl. 351—43 **20 Claims**



1. A face shield for detachably receiving a wrist watch-shaped apparatus including a display, said face shield comprising a lens, holding means for detachably receiving said wrist watch-shaped apparatus, and an optical apparatus disposed to visually couple the display to the lens whereby information provided by the display is transmitted to an area of the lens.

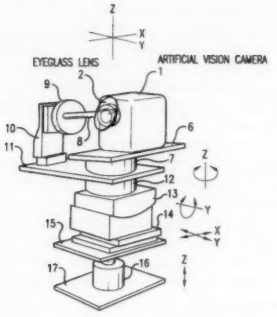
6,039,447

ARTIFICIAL VISION SYSTEM

Atsuo Minato, Tokyo, Japan, assignor to Hoya Corporation, Japan

Filed Feb. 25, 1999, Appl. No. 257,202
Claims priority, application Japan, Mar. 6, 1998, 10-055384
Int. Cl.[7] A61B *3/10*
U.S. Cl. 351—216 **16 Claims**

1. An artificial vision system for simulating a retinal image obtained when an observer views an object through a lens by turning his eyeball, comprising:



an artificial vision camera including an artificial ocular optical system having a simulated turning point and a planar image-pickup;

a lens holder; and

a mechanism operably connected to the artificial vision camera to rotate the artificial vision camera around the simulated turning point relative to a lens held in the lens holder.

6,039,448

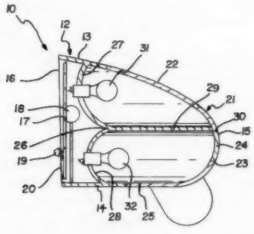
SIDE REARVIEW MIRROR DEVICE

Florin I. Oprea, 12239 Covello St., North Hollywood, Calif. 91605

Filed Oct. 1, 1998, Appl. No. 164,648

Int. Cl.[7] **G02B** *5/08*

U.S. Cl. 359—850 **20 Claims**



1. A side rear view mirror device for mounting to a side of a vehicle, said device comprising:

a housing having an interior, a top, a bottom, a front and a rear, said housing being mountable to the side of a vehicle;

a mirror being mounted to said rear of said housing;

said housing having a frontal opening into said interior of said housing, said frontal opening extending towards said top of said rear of said housing and said bottom of said rear of said housing;

said housing having a cover lens covering said front opening, said cover lens permitting passage of light therethrough;

said cover lens having an upper lens section and a lower lens section and a dividing line extending between said upper and lower lenses of said cover lens;

said upper lens section of said cover lens extending from said front of said housing towards said top of said rear of said housing, said lower lens section of said cover lens extending from said front of said housing towards said bottom of said rear of said housing;

said upper lens section of said cover lens being generally transparent;

said lower lens section of said cover lens having a front region and a bottom region;

said front region of said lower lens section of said cover lens comprising a colored generally translucent material;

said bottom region of said lower lens section of said cover lens being generally transparent;

a reflector member being provided in said interior of said housing, said reflector member having upper and lower reflector portions; and

upper and lower light sources being provided in said interior of said housing, said upper light source being mounted to said upper reflector portion, said lower light source being mounted to said lower reflector portion.

6,039,449

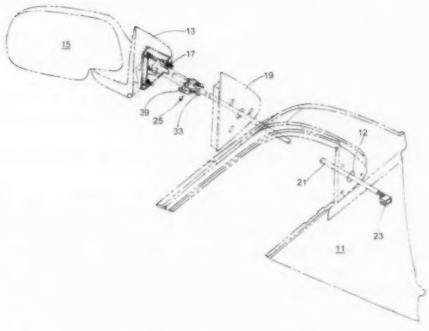
RETAINER CLIP FOR A VEHICLE REARVIEW MIRROR

Daniel J. Dolan, Chalfont, and John S. McPherson, Perkasie, both of Pa., assignors to Delbar Products, Inc., Perkasie, Pa.

Filed Sep. 23, 1998, Appl. No. 158,837

Int. Cl.[7] **G02B** *7/182*

U.S. Cl. 359—871 **18 Claims**



1. A rear view mirror, including a temporary hold-down clip for holding said mirror to a vehicle body panel during vehicle assembly, comprising:

a mirror housing with a mirror affixed thereto;

a plurality of fastening studs secured to said housing and projecting therefrom in a direction of attachment to said vehicle body panel;

a sleeve having an aperture, said sleeve projecting from said housing in the direction of attachment of said studs; and

a set of elongate snap-fit fingers located around an outer periphery of said sleeve, said fingers including shanks projecting outwardly from said housing in said direction of attachment whereby said rear view mirror is temporarily held to said vehicle body by said snap-fit fingers inserted into said body panel, said body panel being a portion of said vehicle body.

6,039,450

EXTERIOR REARVIEW MIRROR WITH CABLE PULL ADJUSTMENT

Jan Schubert, Wedemark, Germany, assignor to Bernhard Mittelhäuser, Wedemark, Germany

Filed Jul. 29, 1998, Appl. No. 126,036

Claims priority, application Germany, Jul. 29, 1997, 197 32 456

This patent is subject to a terminal disclaimer.

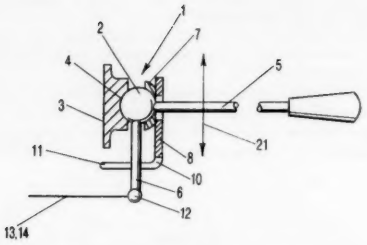
Int. Cl.[7] **G02B** *7/182;* **B60R** *1/06*

U.S. Cl. 359—872 **5 Claims**

1. An exterior rearview mirror for a motor vehicle, said mirror comprising:

a housing (**3**) having a mirror pane (**17**) pivotably connected in said housing (**3**);

first and second cable pulls (**13**, **14**, **15**) having first ends connected to said mirror pane (**17**);



said first and second cable pulls (**13**, **14**, **15**) acting on said mirror pane (**17**) in a same direction to pivot said mirror pane (**17**) about a first axis (**18**) and acting on said mirror pane (**17**) in opposite directions to pivot said mirror pane (**17**) about a second axis (**16**) extending perpendicular to said first axis (**18**);

said first and second cable pulls (**13**, **14**, **15**) having second ends;

a transverse member (**12**);

said second ends of said first and second cable pulls (**13**, **14**, **15**) connected to opposite ends of said transverse member (**12**);

a ball joint (**2**, **4**, **7**) connected to said housing (**3**);

an actuating lever (**5**) connected to said ball joint (**2**, **4**, **7**) and accessible from an interior of the vehicle for actuating said ball joint (**2**, **4**, **7**);

an arm (**6**) connected to said transverse member (**12**) and said ball joint (**2**, **4**, **7**);

said arm (**6**) extending at an angle to said actuating lever (**5**) such that said transverse member (**12**) is positioned laterally adjacent to said ball joint (**2**, **4**, **7**) when viewing said ball joint (**2**, **4**, **7**) and said transverse member (**12**) from the interior of the vehicle in a direction of said actuating lever (**5**);

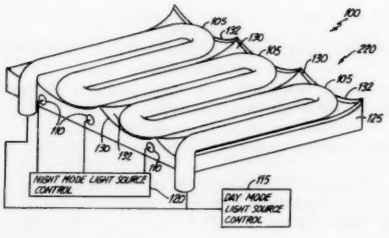
a guide in which said arm (**6**) is guided, said guide (**11**) extending in a direction of said actuating lever (**5**) such that, when said actuating lever (**5**) is moved in an upward or downward direction said arm (**6**) is moved back and forth in said guide (**11**) to thereby cause a transverse movement of said transverse member (**12**) and a movement of said first and second cable pulls (**13**, **14**, **15**) in said same direction.

6,039,451

SCULPTURED TRANSFLECTOR FOR DUAL MODE ACTIVE MATRIX LIQUID CRYSTAL DISPLAY BACKLIGHT

Duane A. Grave, Marion, Iowa, assignor to Rockwell Science Center, Inc., Thousand Oaks, Calif.

Filed Jun. 4, 1998, Appl. No. 90,376
Int. Cl.[7] **G01D** *11/28*
U.S. Cl. 362—29 **20 Claims**



1. An avionics display for use in the cockpit of an aircraft, the display comprising:

a liquid crystal display device;

a day mode light source positioned on a first side of the liquid crystal display device and adapted to controllably provide a first source of light for use by the liquid crystal display device in displaying information during day mode operations;

a night mode light source positioned on the first side of the liquid crystal display device and adapted to controllably provide a second source of light for use by the liquid crystal display device in displaying information during night mode operations; and

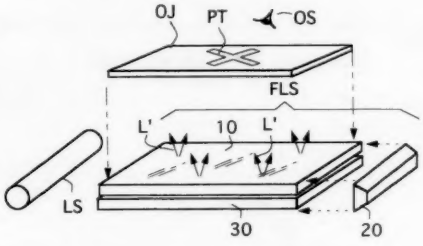
a sculptured transflector positioned between the day mode light source and the night mode light source, a first side of the sculptured transflector adjacent the day mode light source having a transflective material thereon and forming a plurality of arcuate surfaces, wherein the transflective material and the plurality of arcuate surfaces are adapted to maximize a percentage of light from the day mode light source which is reflected toward the liquid crystal display device.

6,039,452

FLAT LIGHT SOURCE WITH U-SHAPED CONFIGURATION

Keiji Iimura, 10-8, Akatsuka 3-Chome, Itabashi-ku, Tokyo 175-0092, Japan

Division of application No. 08/805,699, Feb. 25, 1997. This application May 12, 1999, Appl. No. 310,628.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] **G01D** *11/28*; **G02F** *1/1335*
U.S. Cl. 362—31 **30 Claims**



1. A flat light source with U-shaped configuration, comprising:

a first transparent portion for use for illumination, being composed of a first substantially flat light transmission means;

a second transparent portion for use as bypass light guide, being composed of a second substantially flat light transmission means, positioned substantially parallel with said first substantially flat light transmission means;

a light coupling portion for use as light coupling between said first and second transparent portions, having at least one optical prism;

wherein each of said first and second transparent portions forms a substantially linear cross section of a substantially U-shaped configuration;

wherein said light coupling portion, being positioned near a bottom between said first and second transparent portions, forms a substantially bent cross section of said U-shaped configuration; and

thereby said first transparent portion, said second transparent portion and said light coupling portion form said substantially U-shaped configuration as a whole.

6,039,453

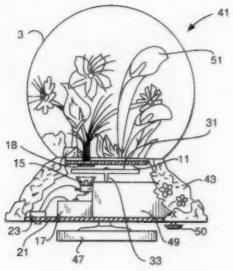
LIGHTED WATER GLOBE

Shiuh-Liang Wang, 815 N. First St., Alhambra, Calif. 91801

Filed Feb. 4, 1998, Appl. No. 18,503
Int. Cl.[7] **F21V** *3/00;8/00;31/00*
U.S. Cl. 362—101 **18 Claims**

1. A lighted water globe comprising:

a base having a hollowed interior;



a water filled sealed glass dome arrangement supported on said base, said glass dome arrangement comprising a glass dome having an open lower extension and a flexible rubber sealing member closing said open lower extension, said flexible rubber sealing member having a hole formed therein, said hole defining a light transmissive window through which light may pass;

a bundle of fiber optic elements disposed within said glass dome arrangement, said fiber optic elements terminating at an end of said bundle adjacent said light transmissive window; and

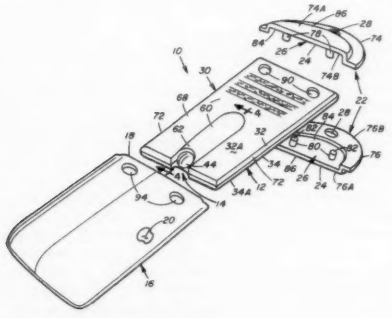
a light source disposed in said base interior directing light to said bundle end through said light transmissive window.

6,039,454

FLAT FLASHLIGHT DEVICE WITH KEY RING ATTACHMENT AND REGISTERABLE AND MATEABE PARTS

Bjarki Hallgrimsson, Ottawa, Canada, assignor to Lumatec Industries, Inc., Austin, Tex.

Filed Apr. 14, 1998, Appl. No. 60,563
Int. Cl.[7] **F21V** *33/00;* **F21L** *7/00*
U.S. Cl. 362—116 **22 Claims**



1. A flashlight device, comprising:

(a) an inner light generating module having means for generating light, said inner light generating module including an inner casing having an upper plate and a lower plate, said upper and lower plates being attachable to one another and together defining a cavity, said upper plate having an actuating portion overlying said cavity, said means for generating light including a bulb, a pair of leads spaced from one another and being connected to and extending from said bulb and a battery disposed between said leads and at one side in electrical contact with a first of said leads, said light generating means being disposed within said cavity of said inner casing between said upper and lower plates thereof such that depression of said actuating portion of said upper plate of said inner casing causes a second of said leads to make contact with an opposite side of said battery and thereby complete an electrical circuit between said bulb and battery for generating light;

(b) an outer protective cover having an open end and defining a pocket receiving said inner light generating module; and

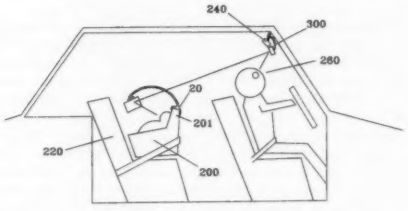
(c) an end cap having an open end and defining a cavity and a hole, said cavity receiving portions of said outer protective cover and inner light generating module, said end cap closing said open end of said outer protective cover and in combination with said outer protective cover enclosing said inner light generating module, said hole for receiving a key ring therethrough.

6,039,455

INFANT OBSERVATION MIRROR ATTACHABLE TO AN INFANT CAR SEAT

Karen Sorenson, RR 4, Site 19, Box 35, Edmonton Alberta, Canada, T5E 5S7

Filed May 12, 1999, Appl. No. 309,635
Int. Cl.[7] **F21V** *33/00;* **G02B** *5/08;7/182*
U.S. Cl. 362—142 **9 Claims**



1. An infant observation mirror attachable to an infant car seat, the infant observation mirror comprising:

(A) fastening assembly means for attachment to an upper edge of the back of the infant car seat;

(B) a curved arm assembly supported at a first end by the fastening assembly means, comprising:

(a) a resilient skeleton; and

(b) a soft covering carried by the resilient skeleton;

(C) mirror assembly means, carried by a second end of the curved arm assembly, for reflecting the face of a baby carried in a rear-facing infant car seat;

(D) adjustment assembly means, carried by the mirror assembly means, for allowing rotation about a horizontal axis and a vertical axis, thereby allowing accurate positioning of the mirror assembly means; and

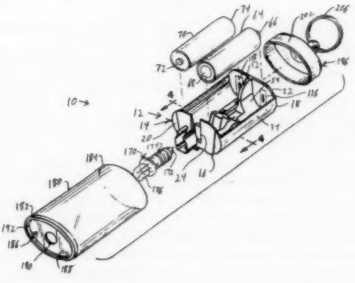
(E) lighting assembly means, supported within the adjustment assembly means, for producing a soft light.

6,039,456

SQUEEZE-ACTIVATED FLASHLIGHT

Paul R. Chabria, Wayne, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.

Filed Jun. 4, 1999, Appl. No. 325,949
Int. Cl.[7] **F21L** *4/00*
U.S. Cl. 362—189 **10 Claims**



1. A flashlight comprising:

a housing having a first end and a second end, said housing including a first end wall at said first end of said housing, said first end wall including an aperture, a second end wall at said second end of said housing, a bottom wall located between said first and second end walls, a first side wall and a second side wall, said first and second side walls being respectively located on opposite sides of said bottom wall, a chamber located between said first and second end walls adapted to receive a first battery and a second battery, a first partition located adjacent said first end wall and between said first and second side walls, a second partition located adjacent said second end wall and between said first and second side walls, said second partition being spaced apart from said first partition, said first and second partitions and said first side wall forming a first cradle adapted to receive the first battery and said first and second partitions and said second side wall forming a second cradle adapted to receive the second battery;

a lamp including a first terminal and a second terminal;

a lamp holder attached to said first end of said housing and located externally of said housing, said lamp holder receiving and retaining said lamp;

a first electrical contact located within said first cradle adjacent said first end wall adapted to electrically engage the first battery, a second electrical contact electrically connected to said first electrical contact, said second electrical contact located between said aperture in said first end wall and said first partition, said lamp electrically engaging said second electrical contact, a third electrical contact located within said second cradle adjacent said first end wall adapted to electrically engage the second battery, said third electrical contact being in electrical communication with said second terminal of said lamp, a fourth electrical contact located in said first cradle at said second end wall adapted to electrically engage the first battery, and a fifth electrical contact located in said second cradle at said second end wall adapted to electrically engage the second battery;

an electrical switch adapted to provide selective electrical communication between the first and second batteries and said lamp, said electrical switch including a first electrical conductor member having a first end and a second end, said first end of said first electrical conductor in electrical communication with said fourth electrical contact, and a second electrical conductor member having a first end and a second end, said first end of said second electrical conductor member in electrical communication with said fifth electrical contact, said second end of said second electrical conductor member normally located out of electrical contact with said first electrical conductor member, said second electrical conductor member being resiliently bendable such that said second end of said second electrical conductor member may be selectively pressed into electrical contact with said first electrical conductor member; and

a flexible jacket covering said electrical switch, said jacket adapted to be pressed inwardly and thereby resiliently bend said second electrical conductor member into electrical contact with said first electrical conductor member and thereby illuminate said lamp.

6,039,457

LIGHT BRACKET

Timothy L. O'Neal, Hillsboro, Oreg., assignor to Intex Exhibits International, L.L.C., Beaverton, Oreg.

Filed Dec. 17, 1997, Appl. No. 992,685

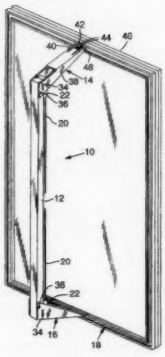
Int. Cl.[7] G09F *13/00;* **F21S** *3/00*

U.S. Cl. 362—217 **32 Claims**

1. A light bracket for mounting and supporting a light adjacent to a surface, comprising:

an elongate member configured to support the light;

a first and a second locking arm, pivotally mounted at opposite ends of the elongate member, each of the arms having an open position extending substantially perpendicular to the elongate member such that each of the arms is configured to mount to the surface and support the elongate member a distance from the surface, and each of the arms being pivotable to a closed position extending substantially parallel to the elongate member such that a space is defined for the light between the first locking arm and the elongate member, and between the second locking arm and the elongate member.



6,039,458

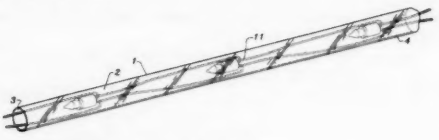
SEGMENTED LIGHT SYSTEM AND METHODS OF USING

Wayne L. Coates, Jr., and David M. Fisher, Jr., both of 1 Riverfront Plz., Suite 650, North Little Rock, Ark. 72114

Filed Oct. 23, 1998, Appl. No. 178,041

Int. Cl.[7] F21V *15/00*

U.S. Cl. 362—249 **15 Claims**



1. A lighting system, comprised of:

at least one string of electrically circuited light bulb sockets having bulbs, and

a plurality of resiliently-rigid light-permeable sub-sleeves, each defining an essentially linear interior cavity and having two opposing open ends, said cavity essentially housing and supporting a respective linear subsection of said light string, each end adapted for cooperating engagement with an end of another of said sub-sleeves aligned therewith, each of said sub-sleeves being cleaved along a longitudinal axis, said cleavage essentially forming a slit along said sub-sleeve thereby essentially creating a first marginal edge both adjacent to and on one side of said slit and a second marginal edge both adjacent to and on the other side of said slit, said sub-sleeves having an essentially closed-slit resting position with said first marginal edge overlapping said second marginal edge along said slit in said resting position.

6,039,459

LIGHTING CIRCUIT AND ANTENNA ARRANGEMENT OF A CELLULAR TELEPHONE

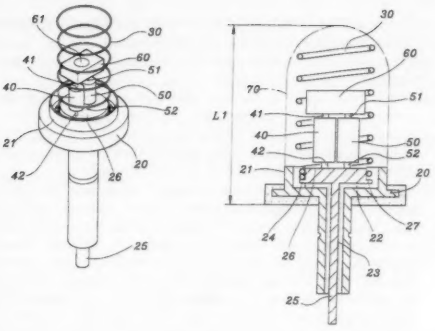
Daniel Chang, Pa-Te, Taiwan, assignor to Auden Technology Mfg. Co., Ltd., Taiwan

Filed Oct. 14, 1998, Appl. No. 172,247

Int. Cl.[7] F21V *33/00*

U.S. Cl. 362—253 **3 Claims**

1. A lighting circuit and antenna arrangement comprising a receptacle covered with a transparent cap, a metal coil holder mounted in said receptacle and insulated from said receptacle by insulative means, a coil mounted on said metal coil holder inside said transparent cap, and a lighting circuit installed in said metal coil holder, wherein said lighting circuit comprises a LED holder



block suspended inside said transparent cap above said metal coil holder within said coil, a LED installed in said LED holder block, said LED having a first end and a second end, a first diode having a first leg at one end connected to the first end of said LED and a second leg at an opposite end connected to said metal coil holder, a second diode having a first leg at one end connected to the second end of said LED and a second leg at an opposite end connected to said metal coil holder.

6,039,460

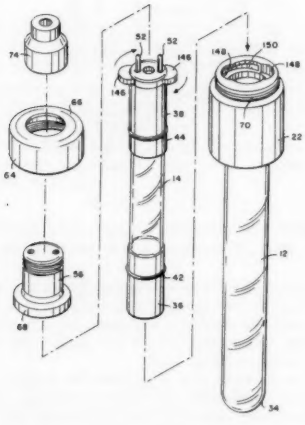
TUBULAR LAMP WITH TRANSPARENT PROTECTIVE OUTER SLEEVE HAVING ONE OPEN END FOR RECEIVING TUBULAR GLASS LAMP BODY WITH TERMINAL PIN ELECTRICAL CONNECTOR

Tony Ng, Chino Hills, and Mike Murphy, Canyon Country, both of Calif., assignors to Aquafine Corporation, Valencia, Calif.

Provisional application No. 60/043,654, Apr. 11, 1997. This application Apr. 10, 1998, Appl. No. 58,257.

Int. Cl.[7] **F21V** *29/00*

U.S. Cl. 362—267 **26 Claims**



1. A tubular lamp mounting arrangement, comprising:

a tubular lamp including an elongated lamp body, and a pair of distal and proximal end caps mounted on said lamp body generally at opposite ends thereof;

a protective sleeve having an open end, said tubular lamp having a size and shape for slide-fit reception into said sleeve, said distal and proximal end caps each including spacer means for positioning said tubular lamp within said sleeve with said lamp body in spaced relation to said sleeve; and

mounting means for mounting said protective sleeve on a substrate with said open end disposed for slide-fit reception of said tubular lamp.

6,039,461

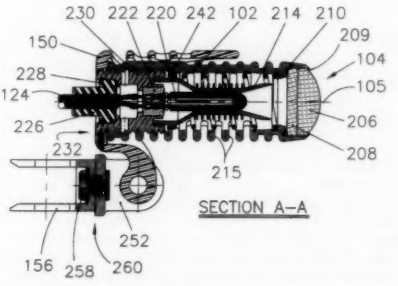
COMPACT HIGH-INTENSITY LIGHTING ASSEMBLY

Tom Cummings, Jackson; David Nowak, Dexter, and Byung Jin Chang, Ann Arbor, all of Mich., assignors to General Scientific Corporation, Ann Arbor, Mich.

Filed Sep. 11, 1998, Appl. No. 151,524

Int. Cl.[7] **F21L** *15/04*

U.S. Cl. 362—287 **7 Claims**



1. A compact, high-intensity light assembly, comprising:

a substantially hollow shell having proximal and distal ends;

a high-intensity light source retained centrally within the shell, the light source having a proximal end connected to electrical wiring which exits through the proximal end of the shell and a distal end which emits light toward and through the distal end of the shell, the light emitted by the source defining an optical axis;

a lens assembly retained within the distal end of the shell, the lens assembly including an optical diffuser and a lens for focussing the light from the source into a preferred illumination area;

a base unit insertable into the proximal end of the shell, the base unit having an apertured proximal end through which the electrical wiring emerges and a distal end including an annular seating lip;

a lamp guide used to hold the light source in a central position within the shell, the lamp guide including a proximal lip configured to rest against the annular seating lip of the base unit; and

a spring disposed within the shell, the spring having a distal end retained within the shell and a proximal end urging the proximal lip of the lamp guide against the annular seating lip of the base unit.

6,039,462

LAMP WITH SAFETY FEATURES

Tom Turner, Whitingsville, Mass., and Robert J. Livergood, Wilmington, Vt., assignors to Holmes Product Corp., Milford, Mass.

Continuation of application No. 08/711,242, Sep. 9, 1996, Pat. No. 5,863,111. This application Jan. 15, 1999, Appl. No. 232,913.

This patent is subject to a terminal disclaimer.

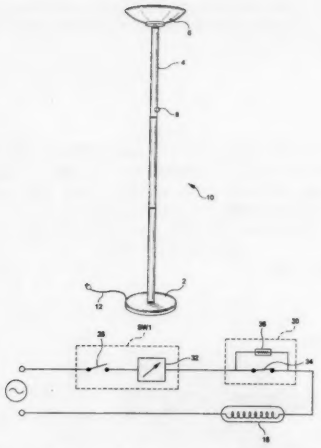
Int. Cl.[7] **F21S** *1//12*

U.S. Cl. 362—410 **16 Claims**

1. A freestanding electric lamp comprising:

a base for supporting the lamp on a floor;

an upwardly directed shade having an open top portion to allow heat to escape upwardly therefrom, the shade defining an interior;



an elongate stem extending between and connecting said shade to said base;

a light bulb socket for supporting a bulb within said shade interior;

a reflector positioned within said shade interior adjacent said socket for directing light generated by the bulb; and

an electrical circuit for providing power to said socket, said circuit including a thermostat electrically connected to said socket, said thermostat sensing ambient air temperature within said shade and being positioned between said reflector and said shade, said thermostat terminating power to said socket in response to sensed ambient air temperature within said shade reaching a predetermined value.

6,039,463

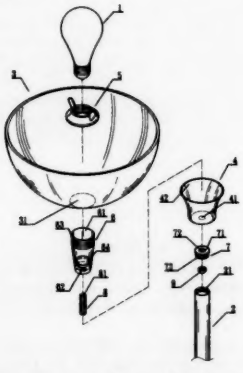
LAMP ASSEMBLY

Shih-Ming Lin, No. 132, Hsi Hsin Street, Chang Ya Tsun, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan

Filed Sep. 8, 1998, Appl. No. 149,087

Int. Cl.[7] **F21S** *1/12*

U.S. Cl. 362—414 **1 Claim**



1. A lamp assembly, comprising a light bulb, a lamp pole, a lampshade, a lamp cup, a butterfly-shaped nut, a light bulb holder, an end cover, a hollow bolt, and a securing nut, wherein

said lamp pole is provided with an internal threaded section on an upper side thereof;

said lampshade is centrally provided with a through hole;

said lamp cup is provided with a through hole in the center of a bottom portion thereof, and a flared portion on an upper side thereof for supporting a bottom portion of said lampshade;

said end cover is formed with a stop edge on an upper side thereof, a central threaded hole, and a small-diameter portion with external threads below said stop edge;

said hollow bolt is centrally provided with a power source wire protective through hole; and

said light bulb holder is formed with a recess and is provided with a threaded hole in the center of a bottom portion thereof, said light bulb holder further having an external threaded section on an upper side, and a light bulb locking seat extending upwardly from the bottom portion, whereby

in assembly, an upper section of said hollow bolt enters the upper side of said light bulb holder to lock with said threaded hole, with a lower portion thereof inserted into said flared portion on the upper side of said lamp cup and out through said through hole of said lamp cup to lock with said central threaded hole of said end cover, said securing nut being utilized to lock with the remaining portion of said hollow bolt, said external threaded section on the lower side of said end cover being locked screwably with said internal threaded section of said lamp pole, said light bulb holder entering via said through hole on the lower side of said lampshade, said butterfly-shaped nut being utilized to lock tightly with said external threaded section on the upper side of said light bulb holder to cause a bottom portion of said lampshade and said flared portion of said lamp cup to be in tight fit for supporting and positioning purposes, whereby said light bulb can directly lock into said light bulb locking seat in said light bulb seat at the bottom and go relatively deep into said light bulb holder.

6,039,464

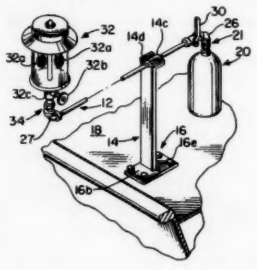
FISHING LIGHT

Lee O. Esprit, 1673 Basile/Eunice Hwy., Basile, La. 70515

Filed Mar. 16, 1998, Appl. No. 39,572

Int. Cl.[7] **B63B** *1/00*

U.S. Cl. 362—477 **11 Claims**



1. An apparatus for connecting a lantern and a fuel source for a lantern to a boat for attracting fish to the boat, the apparatus comprising:

a. an elongated pipe for conveying fuel from a fuel reservoir to a fuel-burning lantern, said pipe having a first end and a second end, said first end of said pipe being adapted to receive a lantern, said second end of said pipe being adapted to receive a fuel reservoir,

b. a pipe holder connected to said boat for holding said elongated pipe, lantern, and said reservoir, said pipe holder being adapted to position said lantern at a distance away from the side of said boat over the water in which said boat may be floating to attract fish to the area beneath said lantern, said pipe holder having a vertical bar extending upwardly from the deck of said boat, said vertical bar having an upper end and a lower end, said pipe being connected to said upper end, said lower end of said vertical bar being connected to a horizontal member, and

c. said boat having a seat connected to a vertical pedestal, said pedestal being connected to the deck of said boat, said horizontal member being connected to said pedestal.

6,039,465

SERVICE COVER FOR A REAR COMBINATION LAMP

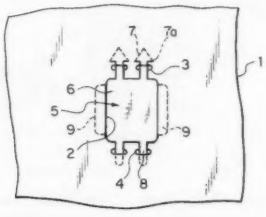
Mineo Hirabayashi; Mamoru Hozumi, both of Aichi-ken, Japan, and Kinsho Fukuta, Derby, United Kingdom, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi-ken, Japan

Filed Oct. 8, 1998, Appl. No. 168,820

Claims priority, application Japan, Oct. 8, 1997, 9-276054

Int. Cl.[7] **F21V** *17/00;* **B60R** *5/00;13/01;* **E06B** *5/00*

U.S. Cl. 362—496 **8 Claims**



1. A service cover which opens and closes a working hole formed in a trim in a trunk room for service work of the rear combination lamp, said service cover comprising:

a substantially rectangular cover body having an area enough to cover the working hole;

first and second retainer portions projecting from a pair of opposite sides of said cover body in opposite directions, respectively; and

jaw portions formed at a tip end of the first retainer portion for preventing the falling of said service cover;

the working hole being closed by inserting said first and second retainer portions into slits formed at both edge portions of the working hole, respectively, the working hole being opened by drawing the second retainer portion away from the corresponding slit and rotating the cover body about the first retainer portion.

6,039,466

MOTOR VEHICLE HEADLIGHT EQUIPPED WITH A DEVICE FOR ADJUSTING THE ANGULAR POSITION OF A REFLECTOR CONTAINED THEREIN

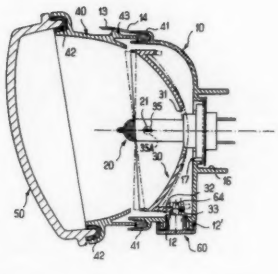
Laurent Duchenne, Etterbeek; Benony Grigorescu, Waterloo, and Jean-Pierre Loiselet, Rebaix, all of Belgium, assignors to Valeo Vision, Bobigny, France

Filed Dec. 16, 1997, Appl. No. 991,366

Claims priority, application France, Dec. 16, 1996, 96 15420; Dec. 16, 1996, 96 15422

Int. Cl.[7] **F21V** *14/04*

U.S. Cl. 362—515 **17 Claims**



1. A headlight comprising:

a casing;

a light source mounted in the casing;

a reflector cooperating with the light source to form a light beam of a predetermined photometry and configured for articulation about an axis through the light source;

a cover disposed to enclose a front opening of the casing; and

an intermediate housing member extending between an anterior edge of the casing and a peripheral edge of the cover and configured to fasten the headlight to a vehicle.

6,039,467

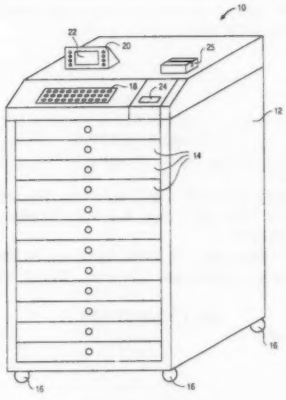
LIGHTING SYSTEM AND METHODS FOR A DISPENSING DEVICE

William K. Holmes, San Diego, Calif., assignor to Omnicell Technologies, Inc., Palo Alto, Calif.

Filed Dec. 5, 1996, Appl. No. 761,726

Int. Cl.[7] **G06F** *17/00;7/00;* **G07F** *11/00*

U.S. Cl. 364—479.01 **27 Claims**



1. A dispensing system, comprising:

a cabinet having at least one storage location;

a plurality of dividers which divide at least a portion of the storage location into a plurality of bins for holding items, wherein at least some of the dividers are adjustable to provide for multiple possible bin arrangements;

a processor having a memory for storing a list of items which are held within the bins and an entry device for entering requests for item removal; and

a plurality of light indicators attached to at least some of the dividers, wherein the light indicators are arranged such that at least one light indicator uniquely identifies one of the bins when lighted, wherein the storage location further includes a plurality of light sources which are in communication with the processor and which provide light to the light indicators, wherein for every possible bin arrangement in said portion of said storage location there is at least one light source and one corresponding light indicator, wherein the processor further includes information relating to the arrangement of the dividers, and wherein selection of one of the items from the list of items causes the processor to send a signal to actuate at least one of the light sources which are associated with the bin having the selected item.

6,039,468

WASHOUT ASSEMBLY FOR CEMENT MIXER VEHICLE

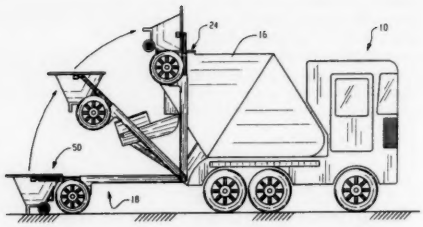
Dennis Kowalcyzk, 7712 Princeton Pl., Middleburg Heights, Ohio 44130

Filed Apr. 2, 1998, Appl. No. 53,979

Int. Cl.[7] **B28C** *5/18;7/14*

U.S. Cl. 366—41 **12 Claims**

1. A concrete mixer truck having a mixing drum and a tag axle assembly which is connected to a rear end of the truck, comprising:



a washout container for receiving and collecting washout material from said mixer truck; and

means for operatively connecting the washout container to the tag axle assembly such that pivotal movement of the tag axle assembly from a ground-engaging position to a raised position causes the washout container to empty said material from the washout container into the mixing drum.

6,039,469

MIXING KNEADER

David Palmer, Groton, Mass., assignor to List AG, Arisdorf, Switzerland

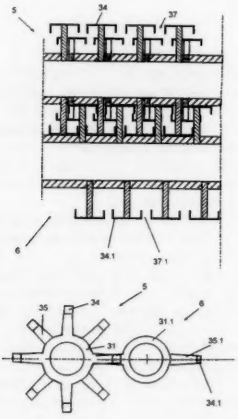
PCT No. PCT/EP96/04145, § 371 Date May 29, 1998, § 102(e) Date May 29, 1998, PCT Pub. No. WO97/12666, PCT Pub. Date Apr. 10, 1997

PCT Filed Sep. 23, 1996, Appl. No. 51,244

Claims priority, application Germany, Oct. 4, 1995, 195 36 944

Int. Cl.[7] **B01F** *7/04*

U.S. Cl. 366—97 **5 Claims**



1. A kneader for kneading and transporting a product through the mixture comprising:

a housing having a product inlet and a product outlet; and

a pair of coaxial shafts rotatably mounted in the housing for transporting the product from the product inlet to the product outlet, each of the pair of coaxial shafts includes a plurality of elements mounted thereon for kneading and transporting the product wherein the plurality of elements on each coaxial shaft are actually spaced thereon to provide a gap therebetween which receives a portion of an element on the other coaxial shaft wherein each element includes a radial carrying element connected to a ring carried on a corresponding coaxial shaft wherein adjacent rings on the coaxial shaft are separated from each other by a tubular section.

6,039,470

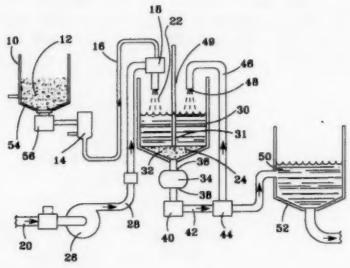
PARTICULATE MIXING SYSTEM

Allyn B. Conwell, 17114 Silverthorne La., Spring, Tex. 77379

Filed Mar. 24, 1997, Appl. No. 823,454

Int. Cl.[7] **B01F** *5/10;15/02*

U.S. Cl. 366—137 **17 Claims**



1. A system for hydrating a dry powder material with a liquid to generate a homogeneous, wetted material, comprising:

a disperser for mixing the dry powder material with the liquid to generate a liquid mixture containing nonwetted particles within said liquid mixture;

a settling tank having an upper end and a lower end, wherein said settling tank is engaged with said disperser for receiving said liquid mixture and for separating said nonwetted particles from said liquid mixture as said nonwetted particles gravitate toward said tank lower end;

a pump having an inlet proximate to and in communication with said tank lower end for removing said nonwetted particles from said tank lower end and further having a pump outlet for discharging said nonwetted particles;

a mixer having a mixer inlet engaged with said pump outlet for processing said nonwetted particles to reduce the size of said nonwetted particles in a process stream, wherein said mixer further has a mixer outlet for discharging said process stream into said settling tank to create the homogeneous wetted material; and

a valve for selectively discharging the homogeneous wetted material.

6,039,471

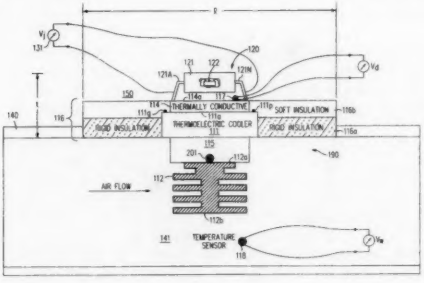
DEVICE FOR SIMULATING DISSIPATION OF THERMAL POWER BY A BOARD SUPPORTING AN ELECTRONIC COMPONENT

Christopher P. Wyland, Santa Clara, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed May 22, 1996, Appl. No. 651,224

Int. Cl.[7] **G01N** *25/20*

U.S. Cl. 374—43 **28 Claims**



1. A board simulator comprising:

a thermoelectric cooler having a first side and a second side opposite said first side, said thermoelectric cooler having a power terminal and a ground terminal, said thermoelectric

cooler having the property of using electrical power received between said power terminal and said ground terminal to cause said first side to be at a first temperature different from a second temperature of said second side;

a first temperature sensor thermally coupled to said first side, said first temperature sensor being capable of indicating a measurement of said first temperature;

a heat sink coupled to said second side, said heat sink having the property of dissipating heat from said second side; and

a second temperature sensor located to determine a temperature at a point between said thermoelectric cooler and said heat sink.

6,039,472

METHOD FOR MEASURING THE TEMPERATURE OF A METALLURGICAL FURNACE USING AN ACOUSTIC NOISE PARAMETER AND RATE OF CONSUMPTION OF ELECTRICAL POWER

Oleg Eduardovich Shlik, Netanya, Israel, assignor to Accusteel Ltd., D.N., Hefer, Israel

Filed May 13, 1998, Appl. No. 78,035

Int. Cl.[7] G01K *11/22;11/26*

U.S. Cl. 374—117 **7 Claims**

1. A method of measuring a temperature of a metallurgical furnace, comprising the steps of:

(a) establishing a relationship between a wavelength of acoustic noise in the furnace and a rate of consumption of electrical power by the furnace;

(b) simultaneously:

(i) recording a spectrum of said acoustic noise, and

(ii) measuring said rate of consumption of electrical power;

(c) computing a representative frequency of said acoustic noise from said spectrum; and

(d) inferring the temperature, based on said representative frequency and on a wavelength inferred from said measured rate of consumption of electrical power using said relationship.

6,039,473

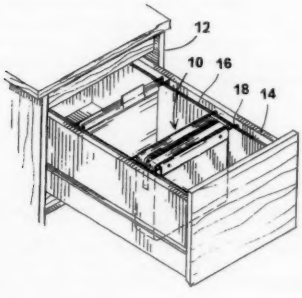
TAMPER EVIDENT FILE HOLDER CONFIGURED FOR HANGING IN A FILE CABINET

Bruce Bond, 9 The Eyrie, Eaglemont, Victoria 3084, Australia

Filed Feb. 18, 1999, Appl. No. 252,316

Int. Cl.[7] B65D *33/34*

U.S. Cl. 383—5 **7 Claims**



1. A tamper evident document file holder comprising:

a substantially rectangular pouch having dimensions compatible with standard file cabinet drawers, said pouch having two opposed substantially rectangular sides, each such side having a flap extending substantially the entire length of said pouch, the flap and the side forming an elongated, open-ended compartment;

a pair of elongated having rods, each such rod extending within a respective said compartment and extending beyond said pouch for hanging said pouch in a file cabinet drawer;

said pouch being fully enclosed except for a zippered opening having a zipper and a locking device, said locking device having means for providing evidence of each opening of said zipper;

wherein said hanging rods are trapped within said compartments for preventing rotation and translation of said rods within said compartments;

further comprising at least one pin extending through each said compartment for pinning said hanger rod.

6,039,474

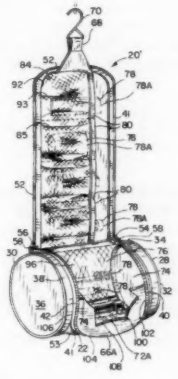
MINIATURE GOLF BAG TRAVEL ORGANIZER

Daniel A. DeChant, 5434 Bremer Rd., McFarland, Wis. 53558

Filed Jul. 31, 1998, Appl. No. 127,470

Int. Cl.[7] B65D *33/25*

U.S. Cl. 383—66 **20 Claims**



1. An organizer for holding utility items comprising:

a miniature golf bag sized to enclose and carry the utility items, the bag having

a tubular main body portion having opposed closed ends, and a reclosable sidewall defining a main body storage compartment, and

a slide fastener having

a first terminus and a second terminus, a track extending between the first and the second terminus,

a pair of self-locking slides mounted on the track, one of each of the pair of self-locking slides associated with one of the two termini, and a pair of pull tabs, one of each of the pair of pull tabs associated with one of the pair of slides;

wherein the slide fastener is incorporated into the tubular main body portion to define the reclosable sidewall, and wherein the pair of self-locking slides of the slide fastener are manipulated to partially open the reclosable sidewall, defining a rectangular flap and a shelf-like portion.

6,039,475

RETAINER FOR ROLLER BEARING AND METHOD FOR MANUFACTURING THE SAME

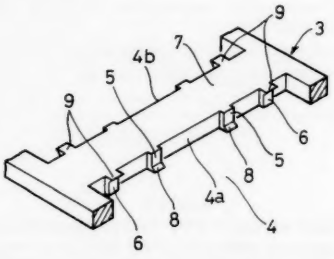
Taichiro Furukawa, Hamamatsu; Kohhei Kondoh, Shizuoka; Atsushi Yamashita, and Seiji Kanbori, both of Fukuroi, all of Japan, assignors to NTN Corporation, Osaka, Japan

Continuation of application No. 08/814,008, Mar. 10, 1997, abandoned, which is a continuation of application No. 08/345,761, Nov. 22, 1994, abandoned. This application Nov. 21, 1997, Appl. No. 976,005.

Claims priority, application Japan, Nov. 30, 1993, 5-300117

Int. Cl.[7] F16C *33/54*

U.S. Cl. 384—580 **2 Claims**



1. A method of manufacturing a retainer for a roller bearing, comprising the steps of forming in a strip a plurality of roller accommodating pockets arranged at intervals with protrusions projecting from both sides of crossbars between said pockets, ironing said protrusions only or said protrusions and the side faces of said crossbars from both directions of thickness of the retainer along the entire thickness of said crossbars, thereby forming roller stopper lugs on both edges of the retainer, and forming said strip into an annular shape.

6,039,476

DRIVE FORCE TRANSMISSION MECHANISM HAVING INCLINED DRIVE SHAFT FOR CAMERA

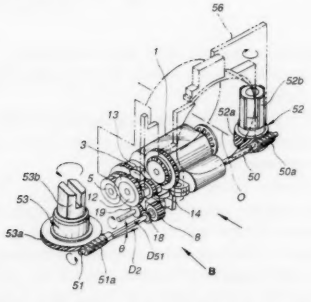
Moriya Katagiri, Tokyo; Yukihiko Sugita, Kokubunji, and Yoshiyuki Kitahara, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1997, Appl. No. 927,612

Claims priority, application Japan, Sep. 13, 1996, H8-243547

Int. Cl.[7] G03B *1/00*

U.S. Cl. 396—418 **17 Claims**



12. A drive force transmission device for a camera, comprising:

first and second drive shafts placed in a non-linear manner so that one of said first and second drive shafts is inclined at an angle relative to another one of said first and second drive shafts, said first and second drive shafts respectively having gears adapted to output a drive force, which is transmitted from a drive source, to wind means or rewind means; and input gears respectively provided on said first and second drive shafts, a drive force transmitted from said drive source being selectively coupling to said input gears by a drive force switching mechanism.

6,039,477

INK RIBBON TAKE-UP MECHANISM HAVING TRANSFER MEMBER

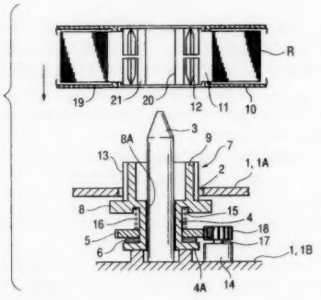
Takanobu Matsuura, Iwate-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1998, Appl. No. 165,607

Claims priority, application Japan, Oct. 16, 1997, 9-283574

Int. Cl.[7] B41J *33/16*

U.S. Cl. 400—236 **2 Claims**



1. An ink ribbon take-up mechanism which comes into engagement with an engaging portion formed on the side of a ribbon cassette loaded onto a carriage of a printer and which uses a rotative driving force of a motor to take up an ink ribbon wound round a pair of cores of said ribbon cassette, said ink ribbon take-up mechanism comprising:

a support shaft projected from a ribbon cassette loading surface of said carriage to a ribbon cassette loading side and adapted to be inserted into said engaging portion formed on the ribbon cassette side to support the ribbon cassette; and

a drive transfer member disposed rotatably on an outer periphery side of said support shaft and adapted to be engaged with said engaging portion formed on the ribbon cassette side to transmit the rotative driving force of said motor to said engaging portion, said drive transfer member having a circular base plate formed with a hole for insertion therein of said support shaft, and a generally cylindrical drive transfer portion formed on an upper surface of said circular base plate, said drive transfer portion having a plurality of engaging portions formed on an outer peripheral surface thereof circumferentially at equal intervals to transmit the rotative driving force to said engaging portion formed on the ribbon cassette side, and said drive transfer member is rotatably fitted on said support shaft so that a tip end side of said drive transfer portion is projected from a projection hole formed in said ribbon cassette loading surface.

6,039,478

ERGONOMICAL KEYBOARD ASSEMBLY

Chin-Wen Chou, Taipei Hsien, Taiwan, assignor to Shin Jiuh Corp., Taiwan

Filed Apr. 16, 1999, Appl. No. 293,058

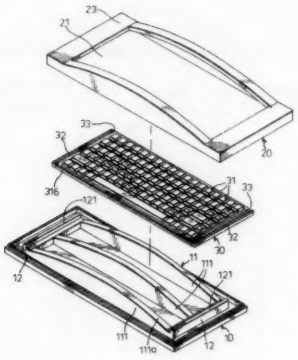
Int. Cl.[7] B41J *5/08*

U.S. Cl. 400—472 **5 Claims**

1. An ergonomical keyboard assembly, comprising:

an upper cover including a hollow frame, and an opening confined by said frame, said opening having opposite ends and an intermediate portion;

a lower base plate connected to said cover; and



a keyboard having a substrate mounted on said base plate below said cover, and a plurality of keys mounted on said substrate having key caps projecting upward and outward from said cover through said opening, said substrate having a top face which is arched and which protrudes upward, said key caps forming an arched overall key surface that projects upward and outward through said opening and that is arched upward from said opposite ends of said opening to said intermediate portion, said substrate comprising a flexible plate forming said arched top face, said base plate including a support to hold said substrate, said support having an arched surface and including a plurality of support strips which extend lengthwise and which project upward from said base plate, said support strips having arched top ends.

6,039,479

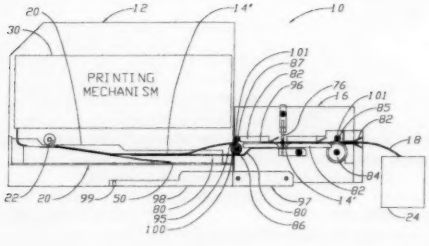
PRINTING ASSEMBLY WITH CONTINUOUS STOCK CUTTER AND SHEET FEEDER FOR FEEDING CUT SHEETS TO PRINTER

Jeffery L. Hill, Mundeline, and Gregory S. Hill, Lake Zurich, both of Ill., assignors to Dynetics Engineering Corporation, Inc., Lincolnshire, Ill.

Division of application No. 08/521,350, Aug. 29, 1995, Pat. No. 5,829,898. This application Aug. 11, 1998, Appl. No. 132,219.

Int. Cl.[7] B41J *11/70*

U.S. Cl. 400—621 **5 Claims**



1. In a printing assembly having a discrete sheet printer with a discrete sheet supply tray and means for automatically transporting a discrete sheet from the supply tray to the printer for printing, the improvement being a continuous discrete sheet supply enhancement apparatus, comprising:

an open tray for receipt through space of at least one discrete sheet;

means for cutting a supply of continuous stock into discrete sheets;

means for transferring a free end of the continuous stock to the cutting means at a feed-in speed; and

means for ejecting a discrete sheet cut from the free end of the continuous stock away from the cutting means with a falling trajectory, through space, that moves the discrete sheets into the open tray for operative engagement with the discrete sheet transporting means of the printer,

said ejecting means including means for ejecting the discrete sheets into space at a feed-out speed greater than the feed-in speed, and

said feed-out speed being sufficiently greater than the feed-in speed to create a gap through space between successive discrete sheets, said gap being of sufficient gap width to enable each discrete sheet to fall sufficiently in its falling trajectory before a next successive sheet is ejected to avoid collision between successively ejected discrete sheets.

6,039,480

METHOD AND APPARATUS FOR FORMING TRANSFER IMAGES AND TRANSFER DRUM USED IN THE SAME

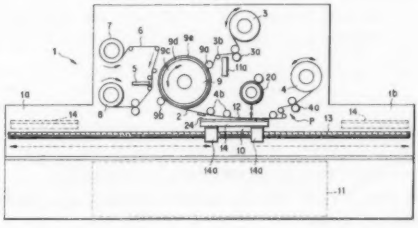
Tomio Andoh; Shiro Shibata, and Tomoyuki Marugame, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1998, Appl. No. 141,139

Claims priority, application Japan, Sep. 2, 1997, 9-236925

Int. Cl.[7] B41J *11/14*

U.S. Cl. 400—662 **16 Claims**



1. A transfer drum for use in a transfer image forming apparatus which causes a thermal head and an ink ribbon to print a transfer image on a transfer film in contact with a surface of the transfer drum and transfers the transfer image to a specific position on an image-transferred member, said transfer drum comprising:

a drum base;

a cushion layer provided on a surface of said drum base; and

a rigid layer with a surface finish of less than 2.0 μm provided on a surface of said cushion layer.

6,039,481

PAPER WIDTH DETECTING APPARATUS AND METHOD FOR INK-JET PRINTER

Sang-Man Ham, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation-in-part of application No. 09/001,468, Dec. 31, 1997, abandoned. This application Jan. 4, 1999, Appl. No. 224,956.

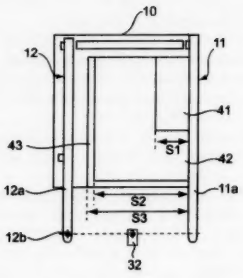
Claims priority, application Rep. of Korea, Dec. 31, 1996, 96/80906

Int. Cl.[7] B41J *29/18*

U.S. Cl. 400—708 **16 Claims**

1. A paper width detecting apparatus for an inkjet printer, comprising:

a right paper support integrally formed with a right home position detecting rib, the right paper support being a home position reference of a paper sheet for printing;



a left paper guide integrally formed with a left paper end detecting rib, the left paper end detecting rib having a light emitting device;

a paper feeding section for receiving at least one paper sheet and for supplying the at least one paper sheet for printing with the left paper guide movable in a left direction and in a right a direction to tightly fix the at least one paper sheet at the home position reference of the right paper support;

a paper feeding roller for supplying for printing the at least one paper sheet received from the paper feeding section;

a carrier that reciprocates for printing on the at least one paper sheet supplied for printing through the rotation of the paper feeding roller; and

a photosensor for detecting a light signal output from the light emitting device mounted on the left paper end detecting rib for determining the paper width of the at least one paper sheet.

6,039,482

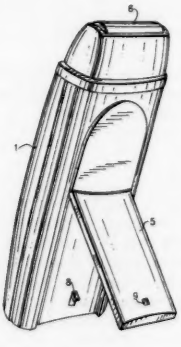
HOT WAX HAIR REMOVER APPARATUS

Henri Smal, Blegny, Belgium, assignor to Conair Corporation, Stamford, Conn.

Filed Jan. 19, 1999, Appl. No. 233,016

Int. Cl.[7] **A46B** *11/08*

U.S. Cl. 401—1 **4 Claims**



1. A hot wax hair remover apparatus comprising a heating sleeve for depilatory wax, equipped with a wax applicator wherein the said heating sleeve is provided with a retractable foot equipped with a spring holding the foot in a deployed position and with means for locking the said foot in the retracted position, against the force of the said spring, controlled by a catch arranged at the base of the said sleeve which releases the said locking means when the said sleeve is put down on a support surface.

6,039,483

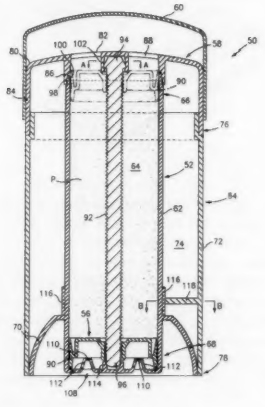
ROTARY DISPENSER

Alex S. Szekely, Jackson, N.J., assignor to The Plastek Group, Erie, Pa.

Continuation-in-part of application No. 08/744,091, Nov. 5, 1996, abandoned. This application Apr. 9, 1999, Appl. No. 289,418.

Int. Cl.[7] **A45D** *40/04*

U.S. Cl. 401—50 **10 Claims**



1. A dispenser assembly, comprising:

an inner housing having an upper end, a lower end, and a wall defining a product space for containing a product to be dispensed;

an outer housing having an upper end, a lower end, and a wall defining an inner space, said lower end of said outer housing at least partially surrounding said lower end of said inner housing, said inner housing being rotatably mounted within said outer housing so that said inner housing can be rotated relative to said outer housing;

means within said inner housing for advancing product toward said upper end of said inner housing responsive to rotation of said inner housing relative to said outer housing; and

a transfer member fixed relative to said outer housing and rotatably associated with said upper end of said inner housing, said transfer member having an applicator surface for applying product to a desired area, and at least one slot in said applicator surface for allowing transfer of product from said product space through said transfer member to said applicator surface.

6,039,484

WRITING INSTRUMENT

Hidehei Kageyama, and Yoshihide Mitsuya, both of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Japan

Filed Jun. 22, 1998, Appl. No. 100,942

Int. Cl.[7] **B43K** *25/00*

U.S. Cl. 401—52 **28 Claims**

1. A writing instrument comprising:

a barrel;

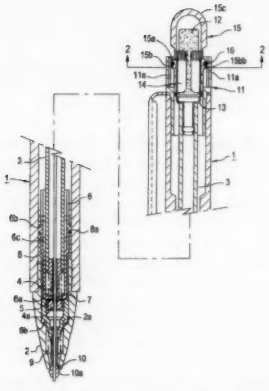
a tip element provided at a front end of the barrel;

means axially movably incorporated within the barrel for advancing a writing medium:

a resilient element incorporated in the barrel for biasing the writing medium advancing means backward;

a knock member inserted in the rear end portion of the barrel and detachably mounted on the rear end of the writing medium advancing means;

the knock member having a pair of spaced apart flanges provided thereon;



cooperating means on the knock member and barrel for preventing the knock member from rotating relative to the barrel;

the cooperating means comprising engaging projection means mounted on the knock member, and engaging groove means formed in an inner portion of the barrel;

the engaging projection means and engaging groove means being engaged with each other, to thereby prevent the knock member from rotating relative to the barrel; and

a rattle-preventive means provided between the pair of spaced apart flanges for preventing the knock member from rattling.

6,039,485

DOUBLE-CHUCK MECHANICAL PENCIL

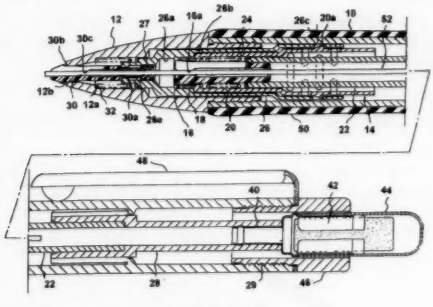
Hidehei Kageyama; Yoshihide Mitsuya, and Tadayoshi Ebinuma, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed May 11, 1998, Appl. No. 75,335

Claims priority, application Japan, May 13, 1997, 9-122683; Jun. 24, 1997, 9-166901

Int. Cl.[7] **B43K** *21/16*

U.S. Cl. 401—67 **26 Claims**



16. A writing instrument, comprising:

a fitting including a tip;

a first chuck located at the tip of the fitting for holding a writing substance and urged in a first direction; and

a second chuck for delivering the writing substance, the second chuck being movable in a second direction, to deliver the writing substance after the first chuck has been moved in the second direction to release the writing substance,

wherein at least one of the first chuck and the second chuck is formed of a synthetic resin material, and

wherein said synthetic resin material comprises polyoxymethylene in which glass fibers are mixed.

19. A writing instrument, comprising:

a fitting including a tip;

a first chuck located at the tip of the fitting for holding a writing substance and urged in a first direction; and

a second chuck for delivering the writing substance, the second chuck being movable in a second direction, to deliver the writing substance after the first chuck has been moved in the second direction to release the writing substance,

wherein at least one of the first chuck and the second chuck is formed of a synthetic resin material, and

wherein said synthetic resin material comprises polyoxymethylene in which a lubricant is mixed.

6,039,486

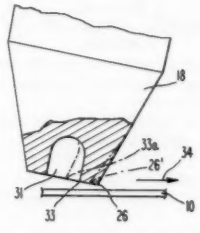
PEN

Daniel V. Breslin, 7934 Ridge Ave., Philadelphia, Pa. 19128

Filed May 15, 1997, Appl. No. 856,969

Int. Cl.[7] **A45D** *40/20*

U.S. Cl. 401—88 **15 Claims**



1. A pen for use on electronically scanned cards and like uses where uniform width of the pen stroke is desirable, comprising:

(a) a pen body adapted to be grasped during use;

(b) a reservoir in the pen body for containing ink;

(c) a deformable tip in communication with said reservoir for receiving ink therefrom, with said tip protruding from an end of the body;

(d) said tip having an unbroken outer periphery; and

(e) a pocket in said tip.

6,039,487

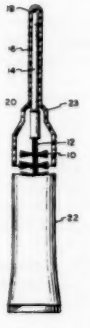
DISPOSABLE DISPENSER OF SAMPLES OF COSMETIC PRODUCT

Gordon Kristiansen, 135 Manor Hill Rd., Stratford, Conn. 06497

Continuation-in-part of application No. 08/724,893, Oct. 3, 1996. This application Dec. 3, 1997, Appl. No. 984,634.

Int. Cl.[7] **A46B** *11/00*

U.S. Cl. 401—126 **3 Claims**



1. A disposable dispenser of samples of cosmetic product comprising:

an applicator having product engaging means, a metal shaft secured at one end to said means, and an elongated plastic rod secured at one end to the other end of said shaft;

an elongated hollow plastic tube sealed at an outer end and open at an inner end, said rod extending within said tube;

an elongated hollow plastic container having a sample quantity of cosmetic product disposed therein, said container being sealed at one end and having an open opposite end designated as a neck, the inner end of the tube being joined to the neck, the region wherein the tube and neck are joined being deliberately weakened; the tube and container having a common direction of elongation;

whereby the tube can be snapped away from the container when separation pressure is applied at the weakened region while the rod remains connected via the shaft to said means, thus permitting the tube and rod to be pulled out of the container to expose the means for use.

6,039,488

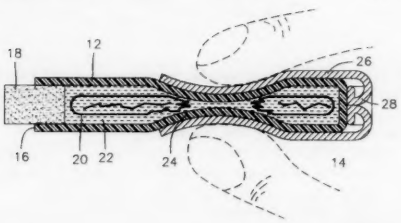
BREAKABLE AMPULE, SWAB AND CAP FOR SCENT MATERIAL

Dwayne M. Krawczyk, LaPlace, and Mabry M. McFarlin, Swartz, both of La., assignors to Louisiana Bucks Unlimited, L.L.C., Monroe, La.

Filed Jun. 25, 1998, Appl. No. 104,202

Int. Cl.[7] B43K *5/14*

U.S. Cl. 401—132 **8 Claims**



1. A dispenser and applicator for scent material comprising a hollow casing having a deformable peripheral wall, said casing including an open end and a closed end, a hollow frangible ampule having a quantity of liquid scent material encapsulated therein, said ampule being positioned within said casing, a dispensing cap removably mounted on and closing said open end of said casing, a porous plug applicator swab in said open end of said casing, said dispensing cap enclosing said swab, said ampule being rupturable within the casing by deforming said peripheral wall inwardly to discharge said scent material into said casing for passage into and through said swabs, said swab being a flexible porous material and extending outwardly of the open end of said casing and receiving liquid scent material from the ampule, when ruptured, to enable the liquid scent material to be directly applied to surface areas by contacting said swab with said surface areas when the dispensing cap is removed and to dispense the liquid scent material directly into the air as an odor from the cap when the cap is mounted on the open end of said casing.

6,039,489

PASTE DISPENSING BRUSH

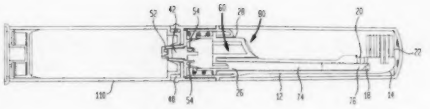
James N. Harman, Brielle, N.J., and Richard J. Upcavage, Fairless Hills, Pa., assignors to ICP Corporation, Brielle, N.J.

Provisional application No. 60/066,529, Nov. 25, 1997. This application Nov. 25, 1998, Appl. No. 199,362.

Int. Cl.[7] B43K *5/02*

U.S. Cl. 401—146 **17 Claims**

1. A stem sealing arrangement for a paste dispensing brush having a paste reservoir and a reciprocating pump for dispensing



the paste to a brush, the pump having a housing defining a housing cavity, and a piston mounted for reciprocating movement within the cavity, the piston separating the housing cavity into a pumping chamber portion and a dry portion, the stem sealing arrangement comprising:

(a) a stem depending from said housing and having proximal and distal end portions, said distal end portion of said stem defining at least one discharge aperture, said stem having a longitudinal bore extending from said proximal end portion and communicating with said at least one discharge aperture;

(b) a sealing boss having a proximal end and a distal end, said sealing boss also having a raised annular ridge, said sealing boss extending from the piston into said longitudinal bore at said proximal end portion of said stem, said raised annular ridge forming an outer surface of said sealing boss forming an interference fit in said longitudinal bore at said proximal end portion of said stem to create a seal in said longitudinal bore at said proximal end portion of said stem, said sealing boss defining an interior channel therethrough communicating with said pumping chamber at said proximal end of said sealing boss and with said longitudinal bore at said distal end of said sealing boss; and

(c) a shut-off member having a proximal end and a distal end, said shut-off member depending from said distal end of said sealing boss and extending through said longitudinal bore in said stem to said at least one discharge aperture, said shut-off member having a shut-off surface for selectively closing said at least one discharge aperture, whereby paste pumped by the reciprocating movement of the piston passes from the pumping chamber portion of the housing cavity through said interior channel of said sealing boss, through said longitudinal bore, and through said discharge aperture, and is prevented by said sealing boss from entering said dry portion of the housing cavity.

6,039,490

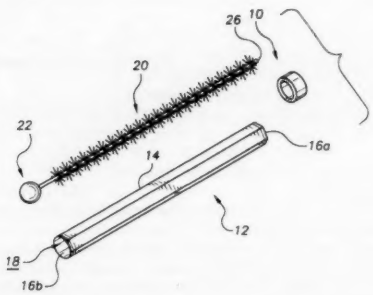
DRINKING STRAW CLEANING SYSTEM

Beverly L. Banks, and Tony C. Banks, both of 5606 John Burruss Rd., Cumming, Ga. 30040

Filed Feb. 17, 1999, Appl. No. 251,866

Int. Cl.[7] B43M *11/06*

U.S. Cl. 401—185 **2 Claims**



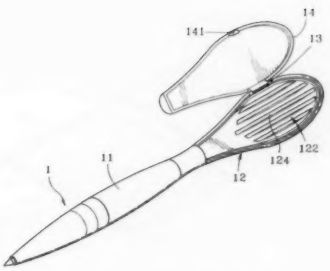
1. A drinking straw cleaning system comprising:

a flexible, tubular brush structure having a tubular cavity formed therein between a closed insertion end and an open ended, an externally threaded squeeze bulb reservoir connecting end, a number of cleaning solution dispensing orifices provided along the length of said flexible tubular brush structure and a

number of multi-length bristles extending radially outward from said flexible tubular brush structure; and

a resilient, spherical squeeze bulb reservoir having an internal cleaning solution reservoir cavity in connection with a threaded fitting companionately threaded to engage and connect with said threaded squeeze bulb reservoir connecting end of said flexible tubular brush structure;

said resilient, spherical squeeze bulb reservoir having an internal cleaning solution reservoir cavity in connection with the threaded fitting compassionately threaded to engage and connect with said externally threaded squeeze bulb reservoir connecting end of said flexible tubular brush structure.

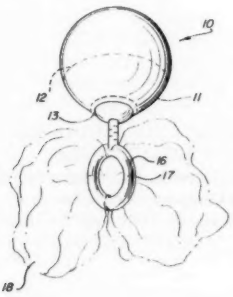


6,039,491

LIQUID SOAP APPLICATOR, AND METHOD

Connie M. Badillo, 2518 N. Shady Forest La., Orange, Calif. 92867

Filed Aug. 7, 1998, Appl. No. 131,216
Int. Cl.[7] B43M *11/06*
U.S. Cl. 401—186 **2 Claims**



1. A method for applying liquid soap from a deformable soap reservoir to a washing means with only one hand, thereby reducing the possibility of a user becoming unbalanced, the reservoir defining a sealable port, and a dispensing connector means defining a filling end, a discharge end, and a perforated, soap dispensing manifold removably connected to the discharge end, the filling end of the connector means being removably inserted into and sealing the sealable port of the reservoir; and, washing means attached to the soap dispensing manifold, the method comprising: A. storing liquid soap in the reservoir in the absence of pressure being applied thereto, the reservoir being adapted for application of pressure with only one hand, pressurizing soap through the sealable port, and through the perforations in the manifold for capture by the washing means; and, B. filling the reservoir by disengaging the connector from the reservoir and disconnecting the connector from the manifold, inserting the discharge end of the connector into the reservoir, and supplying soap through the filling end of the connector and through the discharge end into the reservoir.

6,039,492

PEN

Wei-Chin Chen, 10-3F No. 72, Sec 1, Min-Chuan E. Rd., Taipei, Taiwan

Filed Dec. 4, 1998, Appl. No. 205,355
Int. Cl.[7] B43K *29/00*
U.S. Cl. 401—195 **12 Claims**

1. A pen comprising:

a pen body;

a head member connected to said pen body at one end, said head member comprising a recessed receiving chamber, and a locating groove for securing a display item in said recessed receiving chamber; and

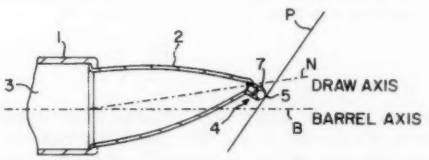
a cover covered on said head member to keep said recessed receiving chamber from sight, said cover having a first lateral side connected to a first lateral side of said head member and a second lateral side detachably secured to a second lateral side of said head member by lock means, said lock means comprising a retaining hole at the second lateral side of said head member and a spring hook at the second lateral side of said cover.

6,039,493

BALL POINT PEN

Mark Arthur Seddon, Reading, and Clive Barnes, Comnor, both of United Kingdom, assignors to The Gillette Company, Boston, Mass.

Continuation of application No. PCT/US97/16272, Oct. 7, 1997. This application Feb. 22, 1999, Appl. No. 253,992.
Claims priority, application United Kingdom, Oct. 8, 1996, 9620985
Int. Cl.[7] B43K *7/00*
U.S. Cl. 401—209 **9 Claims**



1. A ball point writing instrument comprising an ink reservoir within a generally cylindrical body, a hollow nib member connected to a forward end of the body and projecting therefrom, a portion of the reservoir immediately adjacent the nib member having a longitudinal axis, the nib member having a leading end positioned on a longitudinal axis of the nib member and spaced laterally from the axis of the reservoir, and a tip element including the writing ball attached to the leading end of the nib member and extending therefrom towards the axis of the reservoir, the writing surface of the ball being spaced from the axis, in the same direction as that in which the leading end of the nib member is spaced from said axis.

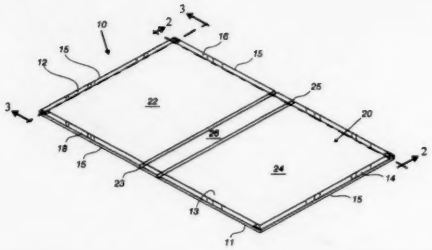
6,039,494

CASING BOARD INCLUDING CLEAR OVERLAY DEFINING EXTERIOR POCKET

Jerry W. Pearce, 2649 Cherry La., Denver, N.C. 28037

Filed Jun. 8, 1998, Appl. No. 93,329
Int. Cl.[7] B42D *3/02*; **B32B** *31/18*
U.S. Cl. 402—73 **14 Claims**

1. A casing board used in the manufacture of articles for organizing, storing, protecting and displaying communications media,



such as papers, audio cassettes, video cassettes and compact discs, said casing board comprising:

a substrate made of a relatively rigid material and comprising a front cover portion, a rear cover portion and a spine portion, said spine portion of said substrate positioned between and hingedly connected to said front cover portion and said rear cover portion, said substrate further comprising an exterior surface, an interior surface opposite said exterior surface and a periphery defined by the longitudinal and lateral edges of said substrate;

an outer wrap made of a flexible polyolefin material and having longitudinal and lateral dimensions greater than the longitudinal and lateral dimensions of said substrate, said outer wrap positioned adjacent said exterior surface of said substrate such that the longitudinal and lateral edges of said outer wrap are turned over said periphery of said substrate and affixed to the interior surface thereof; and

a clear overlay made of a flexible polyolefin material and having a longitudinal dimension greater than the longitudinal dimension of said substrate, said clear overlay positioned adjacent said outer wrap such that the longitudinal edges of said clear overlay are turned over said periphery of said substrate and affixed to the longitudinal edges of said outer wrap, said clear overlay defining a transparent exterior pocket that extends between the longitudinal edges of the casing board;

wherein the longitudinal edges of said clear overlay are affixed to the longitudinal edges of said outer wrap on said interior surface of said substrate by thermal welding.

6,039,495

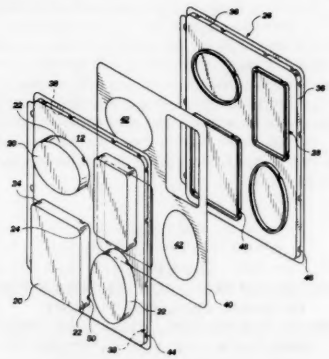
STORAGE PAGE FOR THREE-DIMENSIONAL ITEMS

Julie G. Zimmerman, Draper, and Alex W. Jacobsen, Stansbury Park, both of Utah, assignors to Kallman Corporation, West Jordan, Utah

Filed Apr. 3, 1998, Appl. No. 54,659

Int. Cl.[7] **B42F** *13/00;* **B65D** *73/00;* **A47G** *1/06*

U.S. Cl. 402—79 **15 Claims**



1. A storage page having a three-dimensional cavity for storing and displaying three-dimensional objects, the storage page comprising:

a first sheet of semi-rigid material having a three-dimensional pocket formed therein, the pocket having a transparent front wall and a side wall depending from the front wall;

a second sheet of semi-rigid material having a raised section extending essentially normal to the second sheet, the raised section sized and configured to snugly fit inside the first sheet three-dimensional pocket against the first sheet three-dimensional pocket side wall; and

connecting means for connecting the first sheet three-dimensional pocket to the second sheet raised section and maintaining the connection therebetween to define the three-dimensional cavity, the connection means comprising:

means defining an indentation formed in the second sheet raised section; and

a projection formed in the first sheet three-dimensional pocket side wall that is in registration with, and insertable into, the second sheet raised section indentation, in order to removably retain the second sheet raised section and first sheet three-dimensional pocket together.

6,039,496

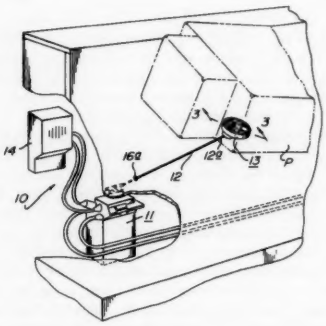
RETRACTOR CABLE CONNECTOR FOR TETHERED PRODUCT DISPLAY

J. Merrill Bishop, Lansdale, Pa., assignor to Vulcan Spring & Manufacturing Company, Telford, Pa.

Filed Jan. 30, 1998, Appl. No. 16,059

Int. Cl.[7] **F16G** *11/00*

U.S. Cl. 403—4 **20 Claims**



1. A device for securing a retractor cable to a product in a tethered product display, comprising:

a base having a cable guideway opening into a recess for receiving a terminal end fitting of a cable and having a rear mounting surface juxtaposed with respect to said guideway and said recess, and

a locking element having a slot affording lateral engagement with said cable adjacent to said terminal end fitting and having a surface operably engagable with said recess surface when said cable is disposed in said cable guideway and tensioned such that said locking element fits within said recess but not through said cable guideway, and

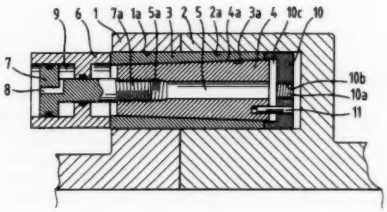
means on said base for fastening said base mounting surface to said product in an abutting relationship such that said recess is closed by the product and said locking element is blocked from exiting said recess.

6,039,497

METHOD FOR COUPLING AND A COUPLING DEVICE

Lars Gullberg, Vasa, Finland, assignor to Wartsila Diesel International Ltd Oy, Helsinki, Finland

Filed Aug. 12, 1997, Appl. No. 911,104
Claims priority, application Finland, Aug. 13, 1996, 963172
Int. Cl.[7] F16B *2/14*
U.S. Cl. 403—16 **14 Claims**



1. An article of manufacture comprising:

a first shaft provided with a flange having a through bore,

a second shaft provided with a flange having a blind bore aligned with the through bore in the flange of the first shaft,

a coupling device including an adapting bolt having an external tapered surface and an axial hole open at the narrower end of the adapting bolt and a cylindrical sleeve element having an internal tapered surface corresponding to the external tapered surface of the adapting bolt, the adapting bolt being within the sleeve element and the coupling device being located in the aligned bores so that the narrower end of the adapting bolt is toward the flange of the first shaft and an end surface of the sleeve element is exposed through the bore in the flange of the first shaft,

a means for engaging the adapting bolt at the axial hole and applying a force tending to displace the adapting bolt relative to the sleeve element in the direction from the wider end of the adapting bolt toward the narrower end thereof, and

a separate end piece in the blind bore and having an annular abutment shoulder for engaging the sleeve element and surrounding a recess for receiving the adapting bolt with a clearance fit, whereby the adapting bolt can be moved relative to the sleeve element in the direction from the narrower end of the adapting bolt toward the wider end thereof without interference from the end piece.

6,039,498

SECURITY SYSTEM

Roger Leyden, Willow Springs, and Terrance Surma, Bloomingdale, both of Ill., assignors to Se-Kure Controls, Inc., Franklin Park, Ill.

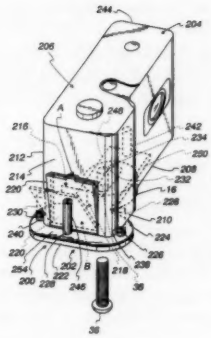
Filed Jun. 9, 1998, Appl. No. 94,131
Int. Cl.[7] E05B *73/00*
U.S. Cl. 403—61 **27 Claims**

1. A security apparatus for an article to be monitored, said security apparatus comprising:

a) a security assembly comprising:

a plate assembly having a first surface facing in a first direction for placement against one surface on an article to be monitored, a first post projecting from the plate and defining a second surface facing transversely to the first direction for placement against another surface on an article to be monitored, and a second post projecting from the plate and defining a third surface for placement against a surface on an article to be monitored; and

a fastener for maintaining the security assembly operatively connected to an article to be monitored; and



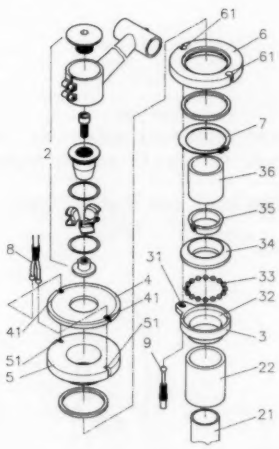
b) an elongate flexible cable connected to and extending from the plate assembly usable to monitor an article to which the security assembly is operationally connected.

6,039,499

SUPPORTING BRACKET FOR BRAKING CABLE OF BICYCLE

Douglas Chiang, 487, Ko-Chung Rd., Ta-Li City, Taichung Hsien, Taiwan

Filed May 4, 1998, Appl. No. 71,595
Int. Cl.[7] B62K *21/12*
U.S. Cl. 403—78 **1 Claim**



1. An improved supporting bracket for a braking cable of a bicycle, comprising:

an external tube (**22**) which at least partially envelopes a vertical tube (**21**) of a front fork member of a bicycle;

an annular lower braking cable socket (**3**) having a truncated shape, said socket (**3**) being biased against a top end of said external tube (**22**);

a retaining emboss (**31**) provided on one side of said socket (**3**);

a receiving slot (**32**) provided within a top of said socket (**3**);

a plurality of steel balls (**33**) movably disposed within said receiving slot (**32**);

a covering lid (**34**) provided on top of said socket (**3**) so as to enclose said balls (**33**) within said receiving slot (**32**);

a first C-type retainer (**35**) disposed between said lid (**34**) of said socket (**3**) and said vertical tube (**21**) such that said lid (**34**) is secured onto said vertical tube (**21**);

a sliding collar (**36**) movably arranged on said vertical tube (**21**) above said lid (**34**);

an upper rotational disk (**5**) arranged on said sliding collar (**36**), said upper rotational disk (**5**) having a pair of retaining slots (**51**) formed on opposite peripheral sides thereof and a lower extension;

a lower rotational disk (**6**) arranged coaxially around said lower extension of said upper rotational disk (**5**), said lower rotational disk (**6**) having at least one retaining slot (**61**) formed on a peripheral side thereof;

a second C-type retainer (**7**) arranged to connect said lower rotational disk with said lower extension of said upper rotational disk (**5**) such that said upper and lower rotational disks (**5** & **6**) move together in an axial direction;

a bowl-type assembly (**2**) disposed at a top end of said vertical tube (**21**);

a primary rotational disk (**4**) disposed on said bowl-type assembly (**2**) above said upper and lower rotational disks (**5** & **6**), said primary rotational disk (**4**) having a pair of retaining slots (**41**) aligned with said retaining slots (**51**) of said upper rotational disk (**5**);

an upper braking cable (**8**) which is branched into two parts, each end of said two parts being disposed within a respective one of said retaining slots (**41** & **51**) of said primary rotational disk (**4**) and said upper rotational disk (**5**); and

a single lower braking cable (**9**) having an end which is disposed within said retaining emboss (**31**) of said socket (**3**) and said at least one retaining slot (**61**) of said lower rotational disk (**6**).

6,039,500

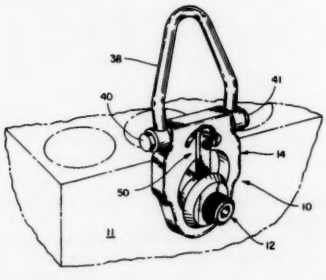
QUICK CHANGE SIDE FULL HOIST RING ASSEMBLY

Yong Chin Kwon, 1901 Mora Ct. Apt. 201, Schaumburg, Ill. 60193

Filed May 5, 1998, Appl. No. 72,823

Int. Cl.[7] **F16D** *1//12*

U.S. Cl. 403—78 **12 Claims**



1. A hoist ring assembly, comprising: an anchor bushing having a fastener adapted to connect to a load, a swivel member rotatable on the anchor bushing, quick release means interfitting the swivel member and the anchor bushing permitting the swivel member to be quickly attached and detached to the anchor bushing, and a shackle pivotally mounted to the swivel member, said swivel member being a hanger lying in a plane transverse to a longitudinal axis of the anchor bushing, said quick release means being operable by sliding the hanger in its own plane.

6,039,501

MODULAR FURNITURE

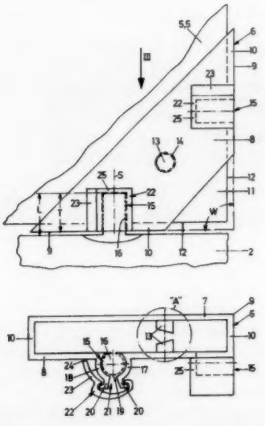
Hubert Rüther, Elbring 12. D-21217, Seevetal, Germany

Filed Jan. 27, 1998, Appl. No. 14,105

Claims priority, application Germany, Jan. 29, 1997, 297 02 242 U

Int. Cl.[7] **B25G** *3/00*

U.S. Cl. 403—231 **7 Claims**



1. A piece of furniture of modular built-up, comprising

a frame (**1**) to be composed of frame pieces (**2**) and frame corner joints (**3**) circumscribing a frame compartment, and

an insert plate (**5**) to be mounted in the frame compartment by means of corner fittings (**6**) as basic structural elements, each corner fitting (**6**)

being detachably mounted on the insert plate (**5**),

having at least one laterally accessible receptacle (**15**) parallel to a plane of the plate for a retaining pin (**16**) mounted on the frame (**1**), and

a locking mechanism (**22**) for arresting the retaining pin (**16**) in the receptacle (**15**), wherein the corner fitting is a clip element (**6**) to be slipped on a corner of the insert plate (**5**) and having internal and external lateral sides (**7**, **8**) that flank a front and rear of the insert plate (**5**) and are connected by connecting legs (**10**) which run at right angles to the plane of the plate, and

wherein the receptacle (**15**) for the retaining pin (**16**) is disposed on an internal lateral side (**8**) of the clip element (**6**), the receptacle (**15**) comprising two springy locking arms (**17**, **18**), which are applied by injection-molding and form therebetween a plug-in opening (**19**) for the retaining pin (**16**).

6,039,502

METHOD OF FORMING A FORMLOCKING CONNECTION OF TWO TELESCOPIC TUBES AND A FORMLOCKING CONNECTION FORMED THEREBY

Dominik Näff, Triesen, Liechtenstein, and René Lörenz, Dornbirn, Austria, assignors to Etablissement Supervis, Vaduz, Liechtenstein

Filed Oct. 1, 1997, Appl. No. 942,081

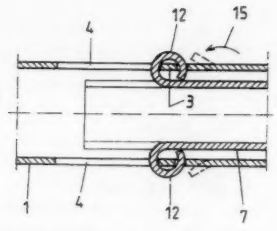
Claims priority, application Germany, Oct. 2, 1996, 196 40 776

Int. Cl.[7] **F16B** *7/00*

U.S. Cl. 403—282 **14 Claims**

1. A formlocking connection of two telescopic tubes axially displaceable relative to each other upon being subjected to an action of an axial force exceeding a predetermined value, comprising:

two elongate cut-outs formed at two diametrically opposite locations in one of the two tubes, respectively, each of the two



cut-outs being separated by at least one web dividing the cut-out in two sections; and

least two strips formed in another of the two tubes at two diametrically opposite locations and rolled over the cut-out dividing webs as a result of a telescopic connection of the two tubes effected by pushing the two tubes toward each other, with the strips of the another of the two tubes being pressed against a forming tool inserted into the elongate cut-outs of the one of the two tubes.

6,039,503

EXPANSION JOINT SYSTEM

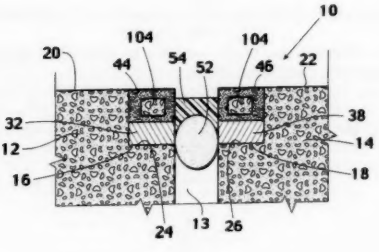
Joe Ray Cathey, Claremore, Okla., assignor to Silicone Specialties, Inc., Tulsa, Okla.

Filed Jan. 29, 1998, Appl. No. 15,741

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **E01C** *11/02;11/06;* **E01D** *19/06*

U.S. Cl. 404—67 **16 Claims**



1. A method to produce an expansion joint for adjacent roadway slabs having an expansion gap therebetween, which method comprises:

a. cutting or forming a recess into the surface of each said adjacent roadway slab to form a pair of recesses adjacent said expansion gap;

b. cleaning the surfaces of said recesses;

c. installing a form spanning said expansion gap;

d. installing a leveling layer of a semi-self leveling mortar mixture of slightly resilient chemically curing polymer and aggregate into each recess;

e. placing high-strength filler blocks on top of said leveling layer;

f. installing said semi-self leveling mortar mixture of slightly resilient chemically curing polymer and aggregate into each recess to form a pair of nosings parallel to and adjacent said expansion gap;

g. inserting a temporary backing between said nosings in said expansion gap; and

h. installing an initially liquid sealant between said nosings to form a flexible seal in said expansion gap between said pair of nosings.

6,039,504

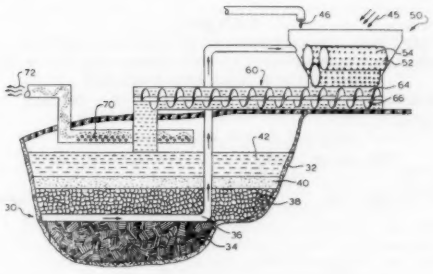
PROCESS AND APPARATUS FOR THE TREATMENT OF WASTE

Armond Muscat, P.O. Box 251, Algonquin, Ill. 60102

Filed Sep. 21, 1998, Appl. No. 157,653

Int. Cl.[7] **B09B** *1/00*

U.S. Cl. 405—129 **14 Claims**



1. A waste treatment process for the treatment of waste comprising the steps of:

first preparing a landfill by first placing a layer of compacted coal at the bottom of said landfill;

covering said layer of compacted coal with a layer of granular coal;

covering said layer of granular coal with a layer of lye;

transporting waste to a processing location near said landfill;

grinding said waste and mixing said waste with a fluid to form a slurry; and

transporting said slurry to said landfill.

6,039,505

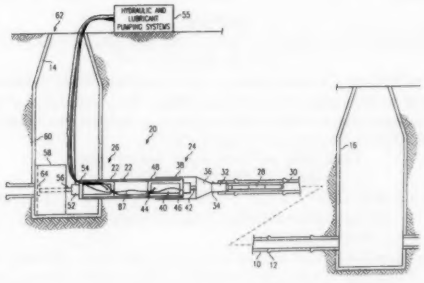
TECHNIQUE FOR ADMINISTERING A LUBRICANT IN AN UNDERGROUND PIPE REPLACEMENT SYSTEM

Albert A. Tenbusch, II, 2206 Marble Falls, Carrollton, Tex. 75007

Division of application No. 08/584,525, Jan. 8, 1996, Pat. No. 5,816,745, which is a continuation-in-part of application No. 08/098,454, Jul. 27, 1993, Pat. No. 5,482,404. This application Mar. 2, 1998, Appl. No. 33,940.

Int. Cl.[7] **F16L** *55/18;1/00*

U.S. Cl. 405—156 **10 Claims**



1. A method of determining frictional forces in an underground pipe replacement system of the type having a frontal hydraulic jack for pushing an expander forwardly so that old pipe can be broken, and a rear hydraulic jack for pushing new pipe sections forwardly together with the frontal jack and the expander, comprising the step of:

activating the rear jack to push the new pipe sections forwardly without pushing the expander forwardly;

activating the frontal jack to push the expander forward; and

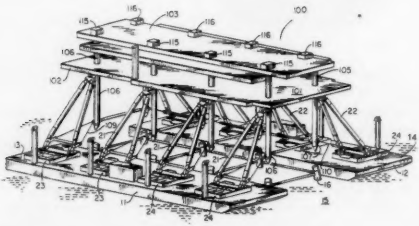
monitoring a hydraulic pressure of at least one of the rear jack or the frontal jack to thereby determine a skin friction resulting from the movement of the new pipes and to determine a penetration friction attributable to the forward movement of the expander.

6,039,506

METHOD AND APPARATUS FOR THE OFFSHORE INSTALLATION OF MULTI-TON PACKAGES SUCH AS DECK PACKAGES AND JACKETS

Jon E. Khachaturian, 5827 Rhodes Ave., New Orleans, La. 70131

Filed Sep. 8, 1997, Appl. No. 925,929
This patent is subject to a terminal disclaimer.
Int. Cl.[7] E02B *17/00*
U.S. Cl. 405—204 **20 Claims**



1. A catamaran work barge apparatus comprising:

a) a pair of barges, each defining a base that can support a large multi-ton load;

b) a work platform supported respectively by the barges that can be positioned next to a package to be lifted, for forming a load transfer between the barges and the package to be lifted;

c) a plurality of diagonally extending lift booms, each lift boom having a lower end attached to a barge and an upper end that can be attached to the work platform;

d) lower connection members for forming attachments between the barges and the work platform;

e) each boom having a free end with a lifting end portion; and

f) a receptacle attached to the work platform that receives the boom lifting free end portion.

6,039,507

METHOD AND DEVICE FOR ASSEMBLING CLUSTER PLATFORMS

Kevin Kennelly, Jakarta Selatan; Ian Gardiner, South Jakarta, both of Indonesia; David Noble, Plano, Tex., and Achmad R. Muliadiredja, Pondok Gede, Indonesia, assignors to Atlantic Richfield Company, Los Angeles, Calif.

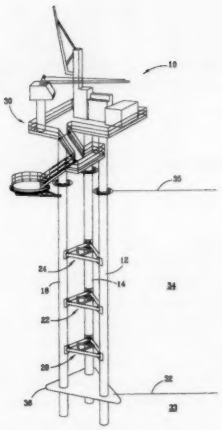
Filed Jun. 26, 1998, Appl. No. 105,650
Int. Cl.[7] E02B *17/00;17/02*
U.S. Cl. 405—227 **7 Claims**

1. A method for constructing a cluster platform in a body of water, the method comprising:

a) embedding three conductors in soil underlying the body of water, the conductors extending above a water surface and being positioned at the corners of a triangular area;

b) fabricating at least one bracing element comprising three surfaces configured to matingly contact the three conductors, the three surfaces being joined by at least three longitudinal members, at least two of which are joined to each surface to configure the bracing element to a triangular configuration having the surfaces positioned to matingly contact the three conductors;

c) lowering the bracing element between the conductors with one surface beneath the other two surfaces to a selected depth;



d) maintaining the one surface at the selected depth and rotating the other surfaces downwardly relative to the one surface to position the one surface and other surfaces in contact with the conductors with the other surfaces being in engagement with the conductors above the one surface;

e) wet welding the surfaces to the conductors, so that the bracing element is wet welded to at least a first conductor of the conductors at a first elevation and wet welded to at least a second conductor at a second elevation above the first elevation; and

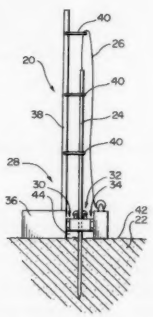
f) securing a deck atop the conductors.

6,039,508

APPARATUS FOR INSERTING ELONGATE MEMBERS INTO THE EARTH

John L. White, Kent, Wash., assignor to American Piledriving Equipment, Inc., Kent, Wash.

Filed Jul. 25, 1997, Appl. No. 900,481
Int. Cl.[7] E02D *7/00;7/26*
U.S. Cl. 405—232 **25 Claims**



1. An apparatus for inserting elongate members into the ground, comprising:

support means for maintaining the elongate member in a desired orientation with respect to the ground;

vibratory means for generating a vibratory force;

shock absorbing means for mounting the vibratory means onto the support means to reduce the transmission of vibratory forces from the vibratory means to the support means;

drive means mounted on the vibratory means for engaging the elongate member such that vibratory loads generated by the vibratory means are transmitted to the elongate member; and

displacing the elongate member along an axis thereof relative to the vibratory means; wherein

the elongate member comprises first and second drive racks arranged on opposing surfaces thereof; and

the drive means comprises first and second gears, where each of the first and second gears engages one of the first and second drive racks to facilitate driving of the elongate member into the ground.

6,039,509

MINE ROOF SUPPORT APPARATUS AND METHOD

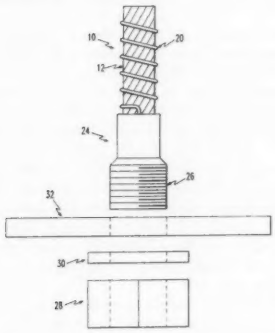
Frank M. Locotos, Bridgeville, Pa., assignor to F. M. Locotos Equipment & Design Co., Bridgeville, Pa.

Continuation of application No. 07/765,374, Sep. 25, 1991, Pat. No. 5,378,087. This application Dec. 30, 1994, Appl. No. 366,985.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **E21D** *20/00;* **E02D** *3/02*

U.S. Cl. 405—302.2 **15 Claims**



1. A mining support for supporting rock within a mine comprising:

a cable;

means for mixing resin in a resin cartridge as the cable is inserted into a bore hole drilled in the rock in which said resin cartridge is disposed, said mixing means positioned about the cable; and

a bending restrictor disposed about the cable such that at least a portion of the cable is prevented from bending as it is inserted into the bore hole.

6,039,510

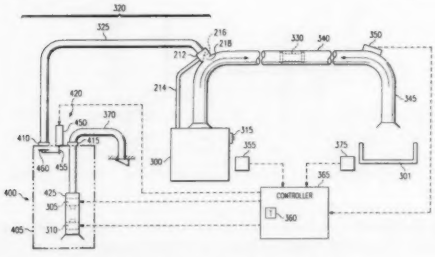
CARRIER AUTOMATIC BRAKING SYSTEM

Harold R. Greene, Lake Kiowa; David W. Carder, Highland Village, and Jack E. Balko, Dallas, all of Tex., assignors to Comco Systems, Dallas, Tex.

Filed Jun. 22, 1998, Appl. No. 102,244

Int. Cl.[7] **B65G** *51/20*

U.S. Cl. 406—21 **21 Claims**



1. A pneumatic transmission system comprising:

a first station for sending or receiving a carrier;

a second station for sending or receiving said carrier;

a transport conduit connected between said first station and said second station, wherein said transport conduit is capable of permitting a transfer of said carrier between said first station and said second station;

a supply/exhaust branch connected to said first station such that air can flow between said supply/exhaust branch and said first station, said supply/exhaust branch having an opening which can serve as an air inlet for providing the air from atmosphere through said supply/exhaust branch to the pneumatic transmission system and as an air vent for exhausting the air from the pneumatic transmission system through the supply/exhaust branch to the atmosphere;

a first motor blower positioned within said supply/exhaust branch, wherein said first motor blower is capable of moving a volume of the air through said supply/exhaust branch and said transport conduit in a first direction;

a valve positioned within said supply/exhaust branch, wherein said valve is capable of stopping the flow of the air through said supply/exhaust branch and said transport conduit;

a sensor associated with said transport conduit so that said sensor is capable of detecting a presence of said carrier at a predetermined location in said transport conduit associated with an approach of said carrier to one of said first station and said second station and of generating a control signal in response to a detection of said carrier by said sensor;

a controller coupled to said sensor and to said first motor blower, wherein said controller activates said first motor blower to move said carrier between said first station and said second station and then deactivates said first blower motor and closes said valve in response to said control signal from said sensor, indicating the detection of said carrier at said predetermined location to thereby form an air block within said supply/exhaust branch to decrease a differential pressure across said carrier and cause said carrier to slow down as said carrier approaches said one of said first station and said second station; and

a timer capable of providing a timing control signal when a predetermined amount of time has elapsed, and wherein said controller activates said timer in response to the detection of said carrier at said predetermined location in said transport conduit associated with the approach of said carrier to said one of said first station and said second station and said controller opens said valve in response to said timing control signal.

6,039,511

CARRYING APPARATUS FOR SPHERICAL OBJECTS

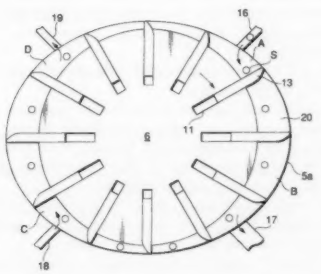
Nobuo Sakai; Migaku Ishida, and Junichi Irie, all of Fukuoka, Japan, assignors to Mitsui High-tec Inc., Fukuoka, Japan

Filed Jul. 9, 1998, Appl. No. 112,382

Claims priority, application Japan, Aug. 22, 1997, 9-226909

Int. Cl.[7] **B65G** *53/00;53/08*

U.S. Cl. 406—46 **13 Claims**



1. An apparatus for carrying spherical objects comprising:

a housing;

a cylindrical rotor arranged in the housing, including a plurality of recess grooves which are open to the outer circumferential

surface, the plurality of recess grooves being arranged radially from the center of the rotor;

a guide ring arranged in the housing, the guide ring including an inner hole, the section of which is elliptical, in which the cylindrical rotor is accommodated;

a plurality of vanes slidably arranged in each recess groove so that a forward end portion of each of the vanes can be contacted with an inner wall of the inner hole;

a first carrier atmosphere feeding pipe connected with a converting section of the guide ring in which the inner hole is changed from a small diameter section to a large diameter section;

a first carrier atmosphere discharging pipe connected with a converting section of the guide ring in which the inner hole is changed from a large diameter section to a small diameter section;

a second carrier atmosphere feeding pipe connected with a converting section of the guide ring in which the inner hole is changed from a small diameter section to a large diameter section; and

a second carrier atmosphere discharging pipe connected with a converting section of the guide ring in which the inner hole is changed from a large diameter section to a small diameter section.

6,039,512

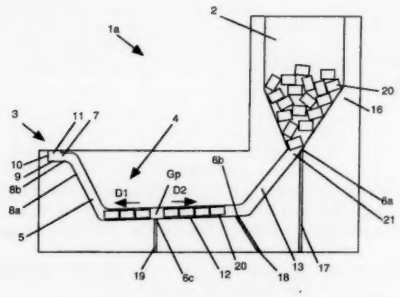
FEEDER SYSTEM AND METHOD FOR SUPPLYING ELECTRICAL COMPONENTS TO A PICKUP LOCATION

Kon Hing Chooi, 50 Lintang Bukit Kecil 3; Ka Tiek Lim, 27 Jalan Sungai Ara 4 Taman Sungai Ara Bayan Lepas, both of Penang, Malaysia, 11900, and Ping Chow Teoh, 123, Taman Mahawangsa, SBG Jalan Putra, Alor Setar, Kedah, Malaysia, 05150

Filed Sep. 18, 1997, Appl. No. 933,190

Int. Cl.[7] B65G *53/66;53/04;53/34*

U.S. Cl. 406—85 **10 Claims**



1. A feeder system for supplying electrical components to a pick-and-place machine, the feeder system comprising:

at least one storage means for storing said components;

a pickup location for supplying said components to said pick-and-place machine;

a passage providing communication between said storage means and said pickup location;

a first air outlet associated with said storage means for providing air blasts to agitate said components stored therein;

a second air outlet located in a surface of said passage for providing air blasts to move said components along said passage towards said pickup location;

a third air outlet located in a surface of said passage for providing air blasts, said third air outlet being disposed between said pickup location and said second air outlet;

a pressurised air supply means operatively coupled to said first, second, and third outlets by respective valves; and

a controller for selectively controlling said valves to concurrently supply air blasts to said second and third air outlets to thereby retain at least at least one of said components therebetween.

6,039,513

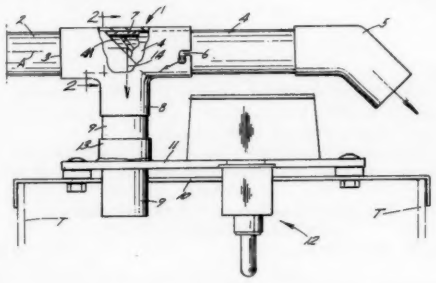
SEPARATOR FOR AIR CONVEYED PELLETS

R. Thomas Law, 448 S. First, #300, Hillsboro, Oreg. 97123

Filed Sep. 15, 1997, Appl. No. 929,046

Int. Cl.[7] B65G *53/60*

U.S. Cl. 406—171 **1 Claim**



1. A separator for removing pellets from an air flow transporting the pellets from a stored area to a hot melt glue tank and venting the air flow, said separator including:

a conduit having an inlet in which the air flow and the pellets borne thereby are received, a pellet discharge outlet in communication with the tank, and an air outlet for venting the air flow,

tubular support means carried by the tank and in communication with said pellet discharge outlet and through which pellets may be discharged into the hot melt glue tank,

a screen in said conduit and supported thereby in inclined relationship to said inlet to divert the airborne pellets impacting the screen toward said pellet discharge outlet for deposit into the glue tank, and

supplemental screens having openings therein of a cross-sectional size different from the like openings in said screen, and locking means confining said screen and said supplemental screens in said conduit.

6,039,514

APPARATUS AND METHOD FOR DRILLING HOLES IN DIMENSIONAL LUMBER

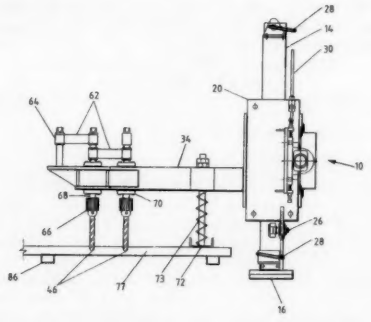
Tim O'Donovan, Sioux Lookout, and Don Fenelon, Hudson, both of Canada, assignors to McKenzie Forest Products. Inc., Ontario, Canada

Filed Oct. 6, 1998, Appl. No. 167,610

Claims priority, application Canada, Nov. 13, 1997, 2221072

Int. Cl.[7] B23B *35/00*

U.S. Cl. 408—1 R **9 Claims**



2. A method of drilling holes in a plurality of elongate pieces of lumber of uniform width comprising the following steps:

conveying the lumber into a position wherein the lumber is arranged in a plane below a plurality of drill bits;

stabilizing the lumber in a drilling position wherein the longitudinal axes of the pieces of lumber are parallel to each other, adjacent pieces of lumber are in contact with each other and an exposed surface of each piece of lumber is perpendicular to a drilling direction;

simultaneously driving a plurality of drill bits such that each drill bit drills a hole in a piece of lumber;

retracting the drill bits from the pieces of lumber;

releasing the lumber from stabilization; and

conveying the drilled lumber away from the drilling position.

6,039,515

DRILL HAVING RADIALLY OVERLAPPING INDEXABLE CUTTING INSERTS

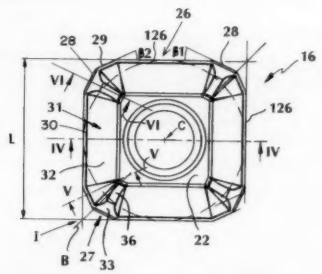
Fredrik Lamberg, Linköping, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Apr. 30, 1998, Appl. No. 69,764

Claims priority, application Sweden, Apr. 30, 1997, 9701664

Int. Cl.[7] **B23B** *51/02*

U.S. Cl. 408—188 **8 Claims**



1. A drill comprising a shank, a central insert, and a peripheral insert;

the shank defining a central axis of rotation and having a central pocket receiving the central insert, a peripheral pocket receiving the peripheral insert, a pair of chip flutes extending rearwardly in an outer periphery of the shank from respective ones of the pockets for conducting chips cut by the central and peripheral inserts, respectively;

the peripheral insert including a first operative cutting edge projecting laterally outwardly beyond the shank to form a diameter of a hole cut by the drill;

the central insert being substantially square and including a second operative cutting edge overlapping the first operative cutting edge at an overlap region spaced radially from the axis of rotation, the second operative cutting edge extending inwardly past the axis of rotation, the central insert forming a rake surface adjacent to the second cutting edge, the rake surface including a first portion disposed at the axis of rotation and a second portion disposed at the overlap region, the second portion having a larger rake angle than the first portion.

6,039,516

EXTENDING SYSTEM

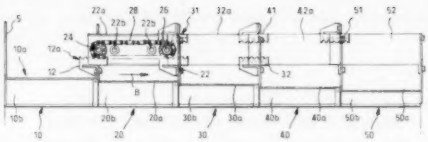
H. Wolfgang Diels, Pfitznesgstrasse 11 80807, München, Germany

Filed Jul. 14, 1998, Appl. No. 115,065

Claims priority, application Germany, Jul. 16, 1997, 197 30 500

Int. Cl.[7] **B23Q** *11/08;* **B23C** *9/00;* **E05D** *15/06*

U.S. Cl. 409—134 **15 Claims**



1. Extending system with at least four extending elements (**10**, **20**, **30**, **40**, **50**) which are disposed behind one another and can be moved relative to one another in a direction of extension (B) as well as a direction of insertion (A) opposed thereto between an inserted position and an extended position, wherein a group of three extending elements (**10**, **20**, **30**) disposed immediately behind one another are connected to one another by way of a coupling arrangement (**12**, **28**, **31**) which, upon relative movement between two extending elements (**20**, **30**) of the group, brings about a forced relative movement between these two extending elements (**20**, **30**) and the third extending element (**10**) of the group, characterized in that the coupling arrangement has a coupling element (**28**) which runs round a return spindle (**24**, **26**), the said return spindle being fixed relative to the middle extending element (**20**) of the group and extending perpendicular to the direction of extension, and the said coupling element (**28**) is movable along a path which is fixed relative to the return spindle (**24**, **26**) and runs round the latter, the coupling arrangement also having two entraining elements (**12**, **31**) which are coupled to corresponding coupling regions (**28***a*, **28***b*) on the coupling element (**28**) and are connected to one of the outer extending elements (**10**, **30**) of the group, wherein the coupling element (**28**) runs at least partially around the return spindle (**24**, **26**) between the coupling regions (**28***a*, **28***b*).

6,039,517

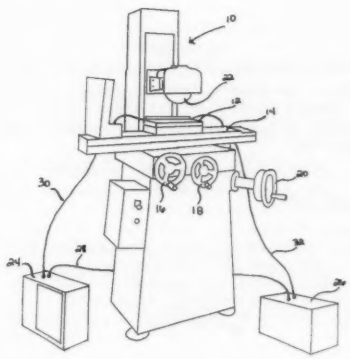
INTERNALLY COOLED MAGNETIC WORKPIECE HOLDER

Daniel Joseph Charewicz, 9712 McConnell Rd., Woodstock, Ill. 60098

Filed Sep. 30, 1997, Appl. No. 941,817

Int. Cl.[7] **B23Q** *3/06;* **B23B** *31/28*

U.S. Cl. 409—135 **42 Claims**



1. An internally cooled magnetic adapter for use between a magnetic chuck and a steel workpiece, the adapter transmitting the magnetic force of the magnetic chuck to the workpiece, the cooled magnetic adapter being formed of a block of non-magnetic material having a first flat planar surface which engages the magnetic chuck, and an opposite flat planar surface upon which a steel workpiece is placed to be held while work is performed on it, said block of non-magnetic material being provided with a plurality of holes extending between said first and opposite flat planar surfaces, a magnetic rod being secured in each of said holes to transmit magnetic force from the magnetic chuck engaging said first planar surface to a workpiece placed on the opposite planar surface, an internal flow path formed through the block of non-magnetic

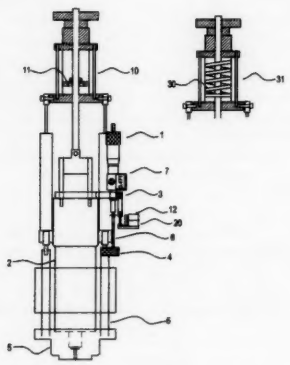
material for receiving a flow of coolant, thereby cooling the adapter and the steel workpiece held thereon.

6,039,518

SURFACE REFERENCED DEPTH CONTROL

Michael E. Day, 2315—B Forest Dr., Suite 35, Annapolis, Md. 21401

Filed Mar. 11, 1997, Appl. No. 815,426
Int. Cl.[7] B23B *49/00*
U.S. Cl. 409—218 **10 Claims**



1. An apparatus for depth control of a spindle assembly comprising:

a. a stop positioned between a pressure foot linkage and the spindle to halt downward travel by the spindle;

b. a means for setting the distance for travel by the spindle relative to the pressure foot linkage; and

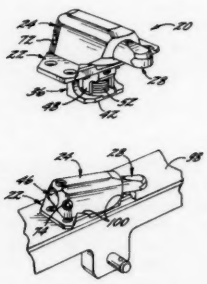
c. a means for absorbing excessive downward travel applied by a Z-drive to the spindle.

6,039,519

IMPACT-RESISTANT RESTRAINT FOR CARGO

John J. Jones, Los Angeles; Rosario S. Saggio, Arcadia; Karlton K. Okamoto, Lakewood, and Isidor Lenoil, West Hills, all of Calif., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 25, 1998, Appl. No. 104,878
Int. Cl.[7] B60P *7/08*
U.S. Cl. 410—69 **16 Claims**



1. A device for restraining cargo from movement along a first axis, comprising:

a support adapted to be mounted to a vehicle structure;

a housing mounted to the support such that the housing is rotatable relative to the support about the first axis, the housing being adapted to be generally secured in a predetermined deployed position relative to the support;

a plunger mounted within the housing such that the plunger is slidable relative to the housing along a second axis which is generally perpendicular to the first axis, the plunger having a cargo-engaging end which projects outward from the housing in an extended position of the plunger, the plunger being substantially restrained against movement relative to the housing except along the second axis; and

a plunger-biasing member connected between the housing and the plunger for biasing the plunger toward the extended position;

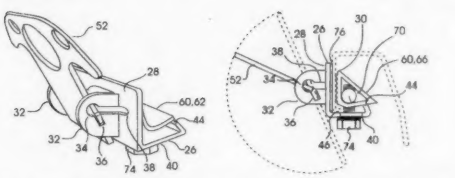
the device resiliently yielding to impact loads thereon such that cargo impacting the plunger generally along the second axis direction depresses the plunger into the housing, and cargo impacting the plunger generally along a third axis direction orthogonal to the first and second axes causes the housing to rotate about the first axis, the plunger being self-deploying such that upon cessation of impact loads thereon the plunger is urged into the extended position so that the plunger is capable of engaging cargo to prevent movement of the cargo along the first axis direction.

6,039,520

TRUCK BED TIE DOWN ANCHOR CLEAT

John C. Cheng, 688 E. Las Flores Dr., Altadena, Calif. 91001

Filed Jan. 6, 1998, Appl. No. 3,109
Int. Cl.[7] B60P *7/08*
U.S. Cl. 410—106 **13 Claims**



1. A truck bed tie down anchor cleat for a utility vehicle having a truck bed with side rails comprising:

a) a structural clamp bracket essentially in a U-shape with a vertical face equivalent in height to a truck bed side rail and a pair of outwardly extending arms formed from said vertical face,

b) a pivoting latch plate disposed movably between said outwardly extending arms for tying down objects within the truck bed,

c) a wedge member contiguously positioned between said clamp bracket and the truck side rail on opposed ends, for removable attachment to the truck body,

d) a rod shaped nut coterminous and centrally superimposed upon said wedge member in a pivotal manner, and

e) tensioning means connected to said nut through said clamp bracket such that a continuous compressive force is exerted between the nut and bracket drawing the wedge member into intimate contact with the truck side rail using the clamp bracket as a fulcrum therebetween and said nut's pivotability permitting variation in wall thickness and shape of the truck side rails.

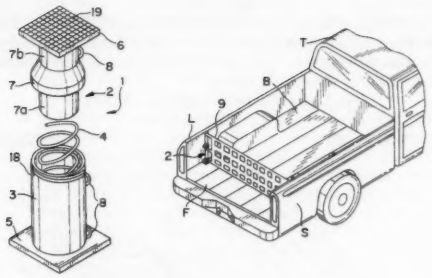
6,039,521

TRUCK BED ENCLOSURE ATTACHMENT POSTS

William T. Sullivan, 318 Whiting Ct., Daphne, Ala. 36526

Filed Jan. 17, 1997, Appl. No. 784,069
Int. Cl.[7] B60P *7/14*
U.S. Cl. 410—118 **7 Claims**

1. A tailgate enclosure attachment post assembly in combination with a cover for enclosing at least a portion of a truck bed, comprising:



means for enclosing a portion of a truck bed,

said means for enclosing a portion of a truck bed extending from one side of said truck bed to another side of said truck bed,

means for securing said post assembly to said truck bed,

means for preventing said post assembly from horizontal slippage with respect to said truck bed,

means for adjusting the height of said post assembly, whereby said post assembly is capable of fitting different size truck beds, and

means for attaching said means for enclosing a portion of a truck bed to said post assembly, and

wherein said cover has a center section and two side sections,

each of said center section and said side sections having fastening means for attaching said cover to a vehicle, and

wherein there is a flap attached to said center section on opposite sides of said center section, and

wherein said center section is wider than said side sections.

6,039,522

AUTOMATIC LOCKING AND UNLOCKING SHORING BAR

Edgardo Cardona, Atchison, Kans., assignor to Kinedyne Corporation, North Branch, N.J.

Filed Jan. 19, 1999, Appl. No. 232,612

Int. Cl.[7] **B60P** *7/14;7/135*

U.S. Cl. 410—127 **7 Claims**

1. A shoring bar comprising elongated first and second telescopingly interconnected tubes, a spring biased actuator interposed between said tubes selectively biasing said tubes longitudinally to increase the shoring bar length, said actuator including elongated first and second elements connected to said first and second tubes, respectively, spring means interposed between said elements longitudinally biasing said elements away from each other, a locking detent mounted upon one of said elements selectively movable between locking and release positions cooperating with a shoulder defined on the other element whereby engagement of said detent and said shoulder occurs in said locking position and retains said elements in a retracted position and disengagement of said detent and said shoulder occurs in said release position and permits said elements to be biased to an extended position, stops defined on said elements limiting relative movement of said elements in said extended position, and a detent shifter fixed with respect to said other element moving said detent between said locking and release positions upon relative axial movement of said elements in a retracting direction.

6,039,523

ADJUSTABLE CONNECTOR SYSTEM

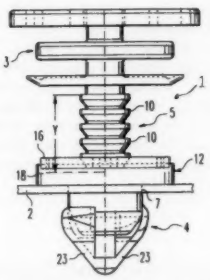
Willibald Kraus, Grünstadt, Germany, assignor to TRW Automotive Electronics & Components GmbH & Co. KG, Germany

Filed Dec. 2, 1998, Appl. No. 204,997

Claims priority, application Germany, Dec. 3, 1997, 197 53 678

Int. Cl.[7] **F16B** *13/06;19/00*

U.S. Cl. 411—48 **49 Claims**



1. An adjustable connector system for holding an associated plate element in a spaced-apart relationship relative to an associated support member, the adjustable connector system comprising:

an engagement member adapted for selective embedded engagement within a support opening formed in the associated support member, the engagement member defining a central opening and further being adapted on a first end to spread open and engage a back side surface of the associated support member, the engagement member being formed as a two-component piece and including a holding element made of a first hard material and an embedding element made of a second soft material;

at least one counter-locking unit carried on said holding element to extend radially inwardly into said central opening, the at least one counter-locking unit being formed of said first hard material

a first connector member having an upper piece and a lower piece, the first connector member defining a neck-shaped intermediary region adapted to be received in the central opening of the engagement member; and,

a plurality of locking elements disposed on the neck-shaped intermediary region to selectively lockingly engage the at least one counter-locking unit when the first connector member is received in the central opening of the engagement member, the plurality of locking elements being cooperative with the engagement member to spread apart the first end of the engagement member into engagement with the back side surface of the associated support member when the first connector member is selectively received in the engagement member.

6,039,524

SELF-LOCKING SAFETY WHEEL NUT WITH LOCKING WRENCH

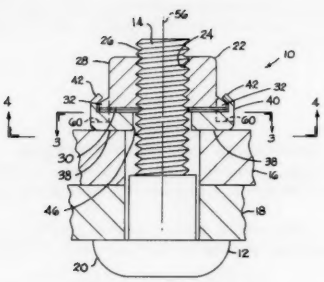
Alistair N. McKinlay, Marina Del Rey, Calif., assignor to Hong Kong Disc-Lock Company Limited, Wanchai, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Sep. 14, 1998, Appl. No. 152,529

Int. Cl.[7] **F16B** *39/24;43/00*

U.S. Cl. 411—149 **12 Claims**

1. A wedge lock fastener assembly comprising:



a threaded nut having a first wedge lock surface, a peripheral flange and first plural circumferentially spaced notches located in said peripheral flange;

a locking washer having a second wedge lock surface and second plural circumferentially spaced notches;

the notches in said washer having the same spacing as the notches in said nut, whereby a tool having circumferentially spaced prongs can be placed so that the prongs extend into the notches in the nut and the washer, after which the tool can be turned to simultaneously loosen the nut and the washer.

6,039,525

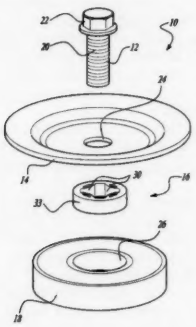
INTEGRATED SPRING RING RETAINER FOR CAPTIVATING A FASTENER TO A WORKPIECE

H. Thad Johnson, 9002 Hidden Trail, Davisburg, Mich. 48350

Filed Oct. 21, 1998, Appl. No. 176,482

Int. Cl.[7] F16B *21/18*

U.S. Cl. 411—353 **13 Claims**



1. A captivated fastener assembly comprising:

a fastener having a head and a threaded shank having a given outer diameter;

a workpiece having an internal bore of a given diameter; and

an annular retainer having a ring portion and a plurality of radially inwardly extending arches, the ring portion having an outer diameter which is greater than the inner diameter of the workpiece bore, the arches defining an inner diameter which is less than the outer diameter of the fastener shank, and the retainer having an outer wall shaped essentially complementary to the shape of the bore to provide a substantially continuous mating surface between the outer wall of the retainer and the inner bore of the workpiece; and

the retainer being press fit within the bore of the workpiece, the shaft of the fastener extending through the retainer, the arches engaging the threaded shank sufficiently to captivate the fastener within the workpiece while allowing axial movement of the fastener shank within the retainer to accommodate external forces on the fastener without disengaging the retainer from the workpiece.

6,039,526

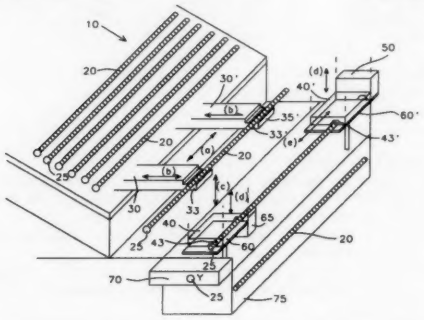
AUTOMATIC PLUG PULLING MACHINE FOR IC TUBES

Chie-Wun Chiou, and Horng-Huei Tseng, both of Hsinchu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed May 11, 1998, Appl. No. 75,894

Int. Cl.[7] B65G *47/78*

U.S. Cl. 414—411 **30 Claims**



1. An automatic plug pulling machine for IC tubes comprising:

a rack for placing integrated circuit tubes thereon;

said rack having a plurality of movable robotic arms;

means to move said movable robotic arms;

a plurality of platforms having at least a first and a second platform adjacent to said rack;

a means to move said second platform;

a plurality of movable clamps which can be positioned over said platforms;

a means to move said movable clamps;

a first plug pusher disposed underneath said first platform;

a means to move said first plug pusher;

a second plug pusher disposed above said first platform;

a means to actuate said second plug pusher;

means to collect plug removed with said plug pushers;

means to displace unplugged said IC tube from said platforms; and

means to collect said unplugged IC tube.

6,039,527

CONTAINER COMBINATION AND A MEHTOD OF HANDLING CONTAINERS

Esa Mylläri, Mönsterås, Sweden, assignor to Multilift Oy, Raisio, Finland

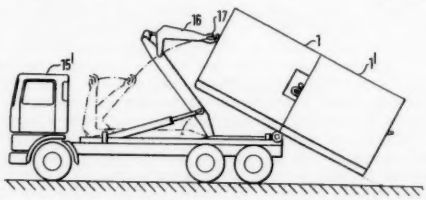
PCT No. PCT/FI95/00036, § 371 Date Jul. 16, 1996, § 102(e) Date Jul. 16, 1996, PCT Pub. No. WO95/20501, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 25, 1995, Appl. No. 676,149

Claims priority, application Finland, Jan. 26, 1994, 940396

Int. Cl.[7] B60P *1/64*

U.S. Cl. 414—491 **10 Claims**



2. A combination of containers for use with a vehicle, comprising:

at least two containers, each container of the at least two containers including

at least one grasping component at a front end of the container for permitting separate handling of each container by a loading device of a vehicle equipped with at least one engaging device for engaging with the grasping component and for lifting the container onto the vehicle and for removing it from the vehicle, and

at least one first connecting device at at least one of the front end and the rear end of the container and at least one second connecting device at at least an opposite one of the front end and the rear end of the container than the at least one first connecting device for forming a connection for connecting the container to adjacent containers of the at least two containers such that a combination formed by connected containers of the at least two containers can be handled as one unit by the loading device,

wherein the grasping component at the front end of any container is of sufficient strength to support the unit formed by the connected containers of the at least two containers while a rear lower edge of a rearmost container of the connected containers is supported on the ground and bottoms of the connected containers are otherwise separated off from any support surface, and wherein the connection has sufficient strength to support the at least two containers as a single, rigid unit when the rear lower edge of the rearmost container of the connected containers is supported on the ground and bottoms of the connected containers are otherwise separated off from any support surface such that forces on the containers tend to urge the containers to fold upwardly around the connection, and also when the at least two containers are inclined and are adapted to rest on a rear roller of a vehicle such that forces on the containers tend to urge the containers to fold downwardly around the connection,

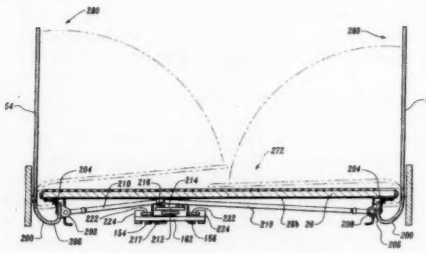
wherein a connecting hook is fixed in a top part of the one of the at least two containers and, in a corresponding place in a top part of the other container of the at least two containers, a connecting rod is provided, the connecting rod being adapted to be fitted to the connecting hook.

6,039,528

WHEELCHAIR LIFT WITH IMPROVED OUTER, INNER, AND SIDE BARRIERS

Alan Cohn, Lockeford, Calif., assignor to Lift-U, Division of Hogan Manufacturing, Inc., Escalon, Calif.

Filed Dec. 31, 1996, Appl. No. 777,583
Int. Cl.[7] B60P *1/44*
U.S. Cl. 414—546 **10 Claims**



1. A wheelchair lift comprising:

(a) a platform frame movable between an extended position and a retracted position;

(b) a wheelchair platform coupled to the platform frame, the wheelchair platform being movable between a raised position and a lowered position; and

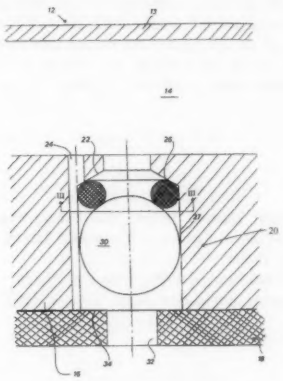
(c) opposing sensitive barriers movably coupled to opposing sides of the wheelchair platform, the sensitive barriers extending upward from an upper surface of the wheelchair platform such that contact between the sensitive barriers and an article on top of the wheelchair platform produces a control signal indicative of the presence of an article contacting the sensitive barrier.

6,039,529

VACUUM LIFTING PLATE WITH SUCTION PASSAGEWAY BALL VALVES

Curt Persson, Torsby, Sweden, assignor to Tepro Machine & Pac-System Aktiebolag, Torsby, Sweden

Filed Nov. 24, 1998, Appl. No. 180,868
Claims priority, application Sweden, May 24, 1996, 9601976
Int. Cl.[7] B66C *1/02*
U.S. Cl. 414—627 **13 Claims**



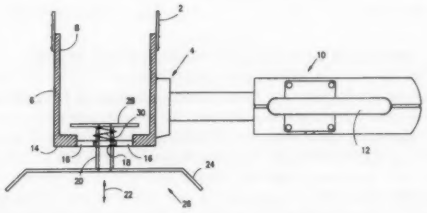
1. An apparatus for lifting and moving articles, comprising at least one arrangement with a cavity, said cavity comprising a vacuum chamber, connected to an arrangement which is capable of producing negative pressure in said vacuum chamber, an underside of a lower plate having an elastic airtight bottom and also having a plurality of first through-passages to said vacuum chamber, wherein each first passage is of cylindrical design with a diameter reduction in a part which is connected to the vacuum chamber, forming a shoulder in each of the first passages, in that each of the first passages contains a body arranged movably in said first passage, in that said body, in planes which are at right angles to the center line of the first passage, has a greatest diameter which is only slightly smaller than the diameter of said first passage, and in that said first passage is provided with a second passage with a considerably smaller diameter than said first passage, said body being capable of essentially blocking said first passage when a negative pressure is obtained in the vacuum chamber with the exception of a given air flow in said second passage.

6,039,530

VACUUM MANIPULATION DEVICE

Kurt Schmalz; Wolfgang Schmalz, both of Dornstetten, and Thomas Eisele, Fluorn-Winzeln, all of Germany, assignors to J. Schmalz GmbH, Glatten, Germany

Filed Apr. 13, 1999, Appl. No. 289,968
Claims priority, application Germany, Apr. 21, 1998, 198 17 754
Int. Cl.[7] B66C *1/02*
U.S. Cl. 414—627 **7 Claims**



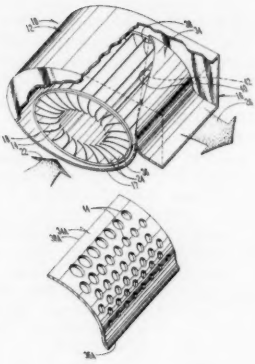
1. A vacuum manipulation device, comprising:

a suction gripper device for placement on an object to be manipulated and for drawing-up the object to be manipulated by suction, said suction gripper device defining a flow cross section into its interior; and

a lifter hose connected to a vacuum-generating device and to said suction gripper device for communicating with the interior of said suction gripper device, wherein:

said suction gripper device includes a weight-actuated regulating element;

said weight-actuated regulating element blocks said flow cross section under the influence of the weight of the object drawn by suction against the suction side of said suction gripper device, and unblocks said flow cross section in the unoccupied state of said suction gripper device.



6,039,531

GAS TURBINE BLADE

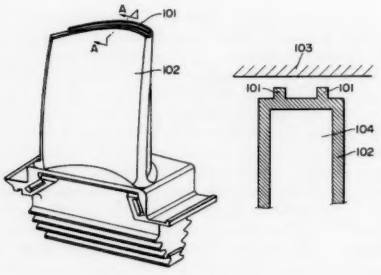
Kiyoshi Suenaga; Yasuoki Tomita, and Hiroki Fukuno, all of Takasago, Japan, assignors to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Filed Mar. 3, 1998, Appl. No. 34,130

Claims priority, application Japan, Mar. 4, 1997, 9-049031

Int. Cl.[7] F01D *5/18;5/20*

U.S. Cl. 415—115 **3 Claims**



1. A gas turbine blade comprising:

a blade having a tip end portion defined by arcuate spaced-apart wall portions which generally oppose one another and a cooling passage formed in the blade tip end portion between the wall portions, the wall portions having outer surfaces which collectively define a blade profile, the blade further including a tip end wall which extends between the blade wall portions at the tip end portion of the blade; and

a protrusion formed on an outer surface of the tip end wall, said protrusion having a shape corresponding generally to said blade profile and being defined by a substantially closed wall comprising opposed spaced apart wall portions positioned on said end wall inwardly of the blade profile and directly above said cooling passage wherein said cooling passage is closed at said tip end portion of said blade.

6,039,532

BLOWER FAN BLADE PASSAGE RATE NOISE CONTROL SCHEME

Kenneth G. McConnell, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Provisional application No. 60/021,958, Jul. 18, 1996. This application Jul. 17, 1997, Appl. No. 895,726.

Int. Cl.[7] F01D *5/10*

U.S. Cl. 415—119 **2 Claims**

1. An blower of the squirrel cage type having an impeller mounted on its axis in a hollow housing, said housing having an air outlet, an air inlet, a radial wall adjacent said impeller, and an outlet wall partially defining said air outlet on a plane that intersects said impeller, said radial wall and said air outlet intersecting at a cut-off area, said improvement comprising:

a surface extending from said cut-off area between said impeller and said outlet for providing a gradual decrease in air flow area between said impeller and said housing, said surface having a plurality of apertures generally decreasing in size toward said cut-off area.

6,039,533

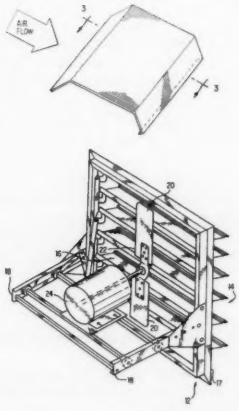
FAN BLADE, STRUCTURES AND METHODS

Francis J. McCabe, #6 Bunker Hill Rd., Ottsville, Pa.

Continuation-in-part of application No. 08/685,134, Jul. 24, 1996, Pat. No. 5,711,653, which is a continuation-in-part of application No. 08/507,129, Jul. 31, 1995, Pat. No. 5,599,172, and a continuation-in-part of application No. 08/990,201, Dec. 13, 1997. This application Jan. 16, 1998, Appl. No. 8,042. This patent is subject to a terminal disclaimer.

Int. Cl.[7] F04D *29/38;25/10*

U.S. Cl. 415—146 **13 Claims**



10. A method of opening and closing a multiple blade damper associated with a motor-driven fan providing thrust upon the operation of the fan, comprising the steps of: movably mounting the fan in proximity to the damper so that the fan can be moved toward and away from the damper; providing and attaching an

operator to and between the blades of the damper and the motor-driven fan to move the blades between open and closed positions upon the operation of the fan to provide thrust.

6,039,534

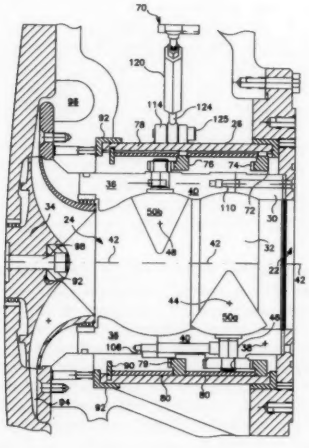
INLET GUIDE VANE ASSEMBLY

George S. Stoner, Portsmouth, N.H., and Peter M. Schoonmaker, Attleboro, Mass., assignors to Northern Research and Engineering Corp, Woburn, Mass.

Filed Sep. 21, 1998, Appl. No. 157,965

Int. Cl.[7] F04D *29/46*

U.S. Cl. 415—162 **19 Claims**



1. An inlet guide vane assembly for a centrifugal compressor comprising:

a guide vane housing having an inlet side for receiving a fluid passing through said compressor at a first flow angle, an outlet side remote from the inlet side and a central axis extending between the inlet and outlet sides of said housing;

a first set of inlet guide vanes pivotally mounted within said guide vane housing between the inlet side and the outlet side thereof for impinging upon said fluid passing through said housing;

a second set of inlet guide vanes pivotally mounted within said housing between the first set of inlet guide vanes and the outlet side thereof for impinging upon said fluid passing through said housing after said fluid has passed through said first set of inlet guide vanes;

a face gear housing supporting a first face gear and a second face gear, the first set of inlet guide vanes being movably connected to the first face gear and the second set of guide vanes being movably mounted to the second face gear, and wherein rotation of said face gear housing about said central axis results in simultaneous rotation of said first and second face gears about said central axis for pivoting said first and second sets of inlet guide vanes, respectively; and

an actuator coupled with said face gear housing for selectively rotating said face gear housing pivoting said guide vanes so as to optimize the efficiency of said centrifugal compressor, wherein movement of said actuator pivots said first set of inlet guide vanes a first angular distance from said central axis while simultaneously pivoting said second set of guide vanes a second angular distance from said central axis, said second angular distance being greater than said first angular distance.

6,039,535

LABYRINTH SEALING DEVICE, AND FLUID MACHINE PROVIDING THE SAME

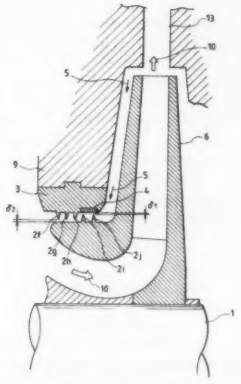
Hiromi Kobayashi; Hideo Nishida; Haruo Miura, all of Ibaraki-ken; Takashi Eino, Tsuchiura, and Kazuki Takahashi, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1998, Appl. No. 102,562

Claims priority, application Japan, Jun. 23, 1997, 9-165617

Int. Cl.[7] F04D *29/08;29/10;29/16*

U.S. Cl. 415—172.1 **4 Claims**



1. A fluid machine having a rotary shaft, at least one centrifugal impeller operatively mounted on the rotary shaft, and a casing which is arranged so as to cover the centrifugal impeller;

wherein one of said rotary shaft and said centrifugal impeller is provided with one of a plurality of first fins and a plurality of second fins which are spaced from the first fins in an axial direction of the fluid machine and the other of said rotary shaft and said centrifugal impeller is provided with the other of the plurality of first fins and the plurality of second fins, a part of the casing opposing said first fins is configured to be subjected to abradable coating to-be-bitten, and said casing and said first fins define therebetween a clearance which is smaller than a clearance defined between said casing and the second fins.

6,039,536

CONNECTION BETWEEN A ROTOR HUB AND A SHAFT OF AN ELECTRIC MOTOR OF AN ELECTRICALLY DRIVEN AIR PUMP

Gunter Van De Venne, Monchengladbach; Frank Kemmerling, Grevenbroich; Michael Bonse, Dusseldorf; Klaus Muckelmann, Hilden, and Rainer Peters, Goch, all of Germany, assignors to Pierburg AG, Neuss, Germany

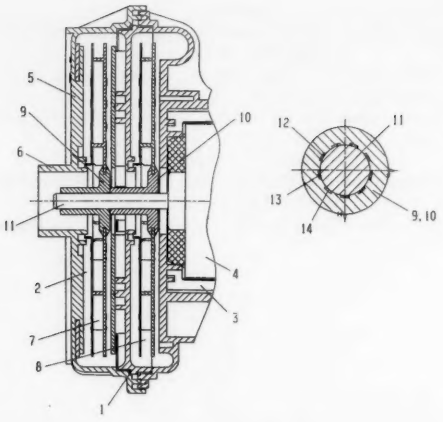
Filed Sep. 30, 1998, Appl. No. 163,637

Claims priority, application Germany, Sep. 30, 1997, 197 43 069

Int. Cl.[7] F01D *25/00*

U.S. Cl. 415—216.1 **3 Claims**

1. In an electric air pump having a housing with a pump mechanism at one end and an electric motor at the other end, the pump mechanism having at least one pump impeller made of plastic material and having a hub which is press-fit on a shaft of the electric motor, the improvement wherein said hub of the at least one pump impeller has a plurality of grooves distributed around a bore in the hub which receives the motor shaft, said grooves forming spaces between an inner surface of said hub and



an outer surface of said shaft, and an adhesive in said grooves to bond said hub to said shaft.

6,039,537

TURBINE BLADE WHICH CAN BE SUBJECTED TO A HOT GAS FLOW

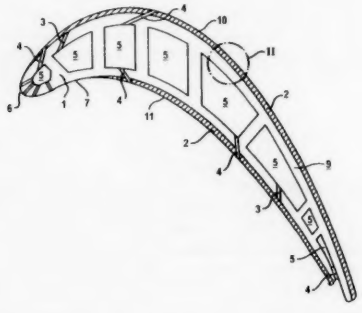
Michael Scheurlen, Mülheim an der Ruhr, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE97/01826, Aug. 22, 1997. This application Mar. 4, 1999, Appl. No. 262,464.

Claims priority, application Germany, Sep. 4, 1996, 196 35 928

Int. Cl.[7] **F01D** *5/18*

U.S. Cl. 416—97 R **12 Claims**



1. A turbine blade to be subjected to a hot gas flow, comprising:

a suction side;

a pressure side;

a substrate having at least one interior space and a plurality of bores leading from said interior space out of said substrate; and

a heat-insulating-layer system at least partly covering at least one of said suction and pressure sides, said heat-insulating-layer system closing at least one bore and leaving at least one further bore open to emit cooling fluid for developing film cooling of said heat-insulating-layer system.

6,039,538

MULTI-BLADE ROTOR FOR A HELICOPTER

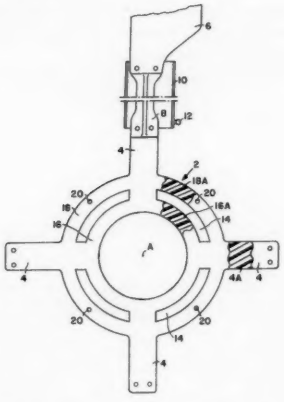
Horst Bansemir, Munich, Germany, assignor to Eurocopter Deutschland GmbH, Munich, Germany

Filed Jan. 12, 1998, Appl. No. 5,551

Claims priority, application Germany, Jan. 17, 1997, 197 01 403

Int. Cl.[7] **B64C** *27/33*

U.S. Cl. 416—134 A **28 Claims**



17. A rotor head plate for connecting a plurality of rotor blades to a rotor mast of a rotary wing aircraft, said rotor head plate being made essentially of a fiber-reinforced composite material and comprising a circular or polygon-shaped annular first ring member and a plurality of blade connection arms supported by and extending radially outwardly from said first ring member, wherein said first rind member is elastically flexible and arranged to allow flexing thereof as said blade connection arms undergo blade flapping motions, wherein radially outer ends of said blade connection arms comprise blade connection locations adapted to have the rotor blades respectively connected thereto, and wherein said first ring member comprises, at positions circumferentially offset from said blade connection arms, rotor mounting locations at which said first ring member is adapted to be rigidly connected to the rotor mast.

6,039,539

RADIAL FAN WHEEL

Gunnar Berg, Hasselgatan 22, S-521 30 Falköping, Sweden

PCT No. PCT/SE96/01106, § 371 Date Jun. 8, 1998, § 102(e) Date Jun. 8, 1998, PCT Pub. No. WO97/09535, PCT Pub. Date Mar. 13, 1997

PCT Filed Sep. 6, 1996, Appl. No. 155,137

Claims priority, application Sweden, Sep. 7, 1995, 9503075

Int. Cl.[7] **B63H** *1/28*

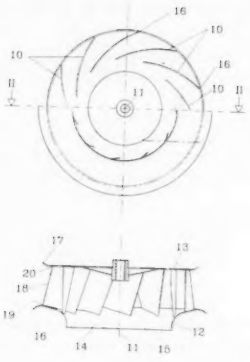
U.S. Cl. 416—186 R **3 Claims**

1. A radial fan wheel for transporting air in ventilation equipment comprising:

a) a number of fan blades (**10**) symmetrically arranged with substantially equal spacing around the rotational shaft (**11**) of the fan wheel,

b) the fan blades being mounted between two end plates (**12**, **13**) that are arranged perpendicularly to said shaft and are provided with blade surfaces which are substantially parallel to said shaft and each of which blade surfaces extends from one point at a distance from said shaft and substantially arched in the direction outwardly toward the periphery of the wheel,

c) one first end plate (**12**) is provided with a central air inlet (**14**), and is shaped with a curve that, in a position radially outwardly from the innermost edges of the blades, substantially arches towards the second end plate (**13**) and further radially outwardly towards the peripheral edge (**18**) of the blades,



d) the peripheral part of the first end plate (**12**) is curved away from the second end plate (**13**),

e) each blade (**10**) is designed having a peripheral segment which extends radially longer outwardly adjacent the first end plate (**12**) than at the second end plate (**13**) and

f) the peripheral edge (**18**) of each blade has a bevel cut edge so that this latter edge meets the first end plate (**12**) at a point (**19**) situated at a distance from the rotation shaft (**11**) which distance is greater than the distance between said shaft and the point (**20**) where the peripheral edge (**18**) of the blade meets the second plate (**13**).

6,039,540

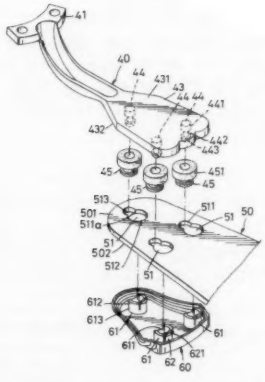
FAN BLADE ASSEMBLY OF A CEILING FAN

San-Chi Wu, No. 69, Sung-Chu Rd., Pei-Tun Dist., Taichung, Taiwan

Filed Oct. 21, 1998, Appl. No. 176,727

Int. Cl.[7] **B63H** *1/20*

U.S. Cl. 416—210 R **3 Claims**



1. A fan blade assembly adapted to be mounted on a rotor of a ceiling fan, said fan blade assembly including a mounting arm having a plate-like blade mounting end portion with a first surface wall, a second surface wall, and a plurality of engaging posts protruding from said second surface wall in a longitudinal direction;

a blade member having a connecting end which has a third surface wall confronting said second surface wall and a fourth surface wall opposite to said third surface wall; and

a cap member having a fifth surface wall confronting said fourth surface wall;

wherein the improvement comprises:

said connecting end further having a plurality of inner peripheral walls that confine respectively a plurality of mounting holes, each of said inner peripheral walls having a constricted portion to divide a corresponding one of said mounting holes into a notch portion and a bore portion of a dimension larger than that of said notch portion;

a plurality of elastomeric coupling members, each of which has a through hole formed therethrough such that a corresponding one of said engaging posts is inserted into and is retainingly engaged in said through hole, each of said coupling members including a shank, and a radial outward peripheral flange projecting from said shank, and being fitted snugly in said notch portion by passing said shank thereinto after said peripheral flange has been brought to pass through said bore portion to rest on said fourth surface wall of said blade member; and

said cap member further having a plurality of annular engaging plugs, each of which extends in the longitudinal direction from said fifth surface wall to form a distal engaging portion and a proximate engaging portion proximate to said fifth surface wall, said distal engaging portion having a guiding portion at a position such that when said engaging plug is brought to be inserted into and fitted snugly in said bore portion of a respective one of said mounting holes, said guiding portion will abut gradually against said constricted portion.

6,039,541

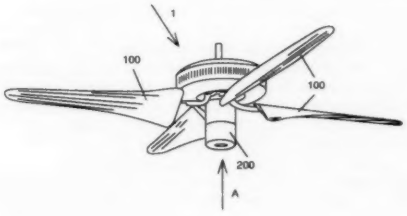
HIGH EFFICIENCY CEILING FAN

Danny S. Parker, Cocoa Beach, Fla.; Guan Hua Su, and Bart D. Hibbs, both of Monrovia, Calif., assignors to University of Central Florida, Orlando, Fla.

Filed Apr. 7, 1998, Appl. No. 56,428

Int. Cl.[7] **F04D** *29/38*

U.S. Cl. 416—223 R **16 Claims**



1. A ceiling fan blade for low speed operation at approximately 50 to approximately 200 revolutions per minute(rpm) for use in overhead ceiling fan systems, the blade comprising:

a positive twist adjacent to a rotor end of the blade, so that blade pitch increases from a tip end of the blade to the rotor end of the blade;

an airfoil having a thicker portion at the rotor end tapering down to a thinner portion at the tip end, for providing high lift and low drag; and

a blade chord having a wider portion from the rotor end tapering down to a narrower portion at the tip end, wherein the blade is operated in a ceiling fan running at low speed ranges of approximately 50 to approximately 200 revolutions per minute(rpm) for use with ceiling fan systems, and provides substantial energy savings and increased air flow over conventional ceiling blades.

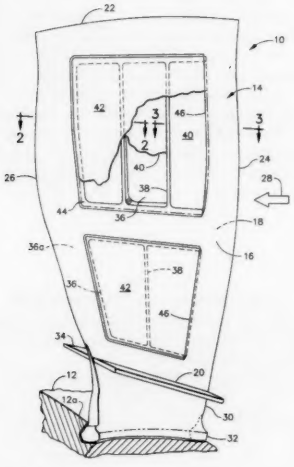
15. A method for operating an overhead ceiling fan system comprising the steps of:

(a) rotating fan blades attached to a ceiling fan at a speed range of approximately 50 to approximately 200 revolutions per minute(rpm);

(b) drawing a power supply of less than approximately 50 Watts; and

(c) generating a downward airflow of up to approximately 6500 CFM from the rotating blades, wherein the ceiling fan system reduces power consumption and enhances axial air flow.

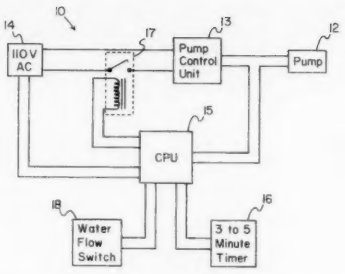
6,039,542
PANEL DAMPED HYBRID BLADE
Jan C. Schilling, Middletown; Jay L. Cornell, Hamilton, and Joseph T. Stevenson, Amelia, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 24, 1997, Appl. No. 997,832
Int. Cl.[7] B64C *11/16*
U.S. Cl. 416—233 **20 Claims**



1. A gas turbine engine fan blade comprising;
a metal airfoil having first and second opposite sides extending radially between a root and a tip, and axially between a leading edge and a trailing edge for pressurizing air channeled thereover, and a pocket disposed in said first side;
a ledge surrounding said pocket at least in part;
an elastomeric filler bonded in said pocket; and
a panel bonded to said filler and to said ledge by said filler for allowing differential movement between said panel and said airfoil for damping vibratory response of said airfoil.

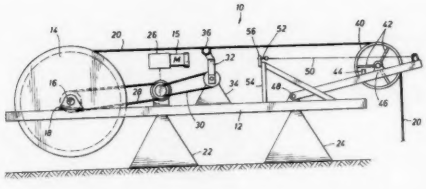
6,039,543
PUMP SHUT OFF SYSTEM
Jerry W. Littleton, 1905 W. 2nd St., Mesa, Ariz. 85201
Filed May 14, 1998, Appl. No. 78,629
Int. Cl.[7] F04B *49/02*
U.S. Cl. 417—12 **8 Claims**

1. A shut off system for a pump, comprising:
a pump having an inlet conduit and an outlet conduit, said pump being for pumping fluid from said inlet conduit to said outlet conduit when said pump is activated, said outlet conduit having a substantially circular lumen with a substantially uniform cross-section along the length of the outlet conduit;
said pump having a primary switch for selectively activating and deactivating said pump;
a processor being electrically connected to said primary switch;
said processor having a timer for measuring a predetermined amount of time;
said timer being activated to measure said predetermined amount of time when said primary switch activates said pump;



said processor deactivating said pump after said timer measures said predetermined amount of time;
said processor having a flow switch, said flow switch having a flow sensor in said outlet conduit, said flow sensor for measuring the fluid flow through said outlet conduit, said flow switch being activated when said flow sensor detects fluid flow through said outlet conduit above a predetermined amount, said flow sensor comprising a paddle arm extending into the lumen of the outlet and pivotally mounted such that flow through said outlet conduit pivots said paddle arm from an orientation wherein a plane of said paddle arm is oriented perpendicular to the flow direction through said outlet conduit; and
said flow switch deactivating said timer to prevent said timer from measuring said predetermined amount of time when said flow switch is activated by said flow sensor when said flow sensor detects fluid flow through said outlet conduit above said predetermined amount during said predetermined amount of time.

6,039,544
OIL LIFT SYSTEM
Charles Strickland, Hampton, Ark., assignor to Jerry Alexander, and Kenneth L. Hofler, Sr., both of El Dorado, Ark.
Filed Feb. 27, 1998, Appl. No. 32,403
Int. Cl.[7] F04B *23/00;* **E21B** *43/00*
U.S. Cl. 417—53 **20 Claims**



1. A well pumping apparatus comprising:
(a) a support adjacent to a wellhead;
(b) a drum storing cable operable in both directions to retrieve or extend therefrom wherein the cable extends into the well borehole;
(d) a bail attached to the end of the cable;
(e) a stinger adapted to insert into the bail on retrieval thereof to enable stinger removal of bail carried oil from the borehole; and
(f) a control system for responsively lowering and raising the bail to thereby remove produced liquids from the well in the

bail and to return the bail in the well borehole for cyclic operation.

6,039,545

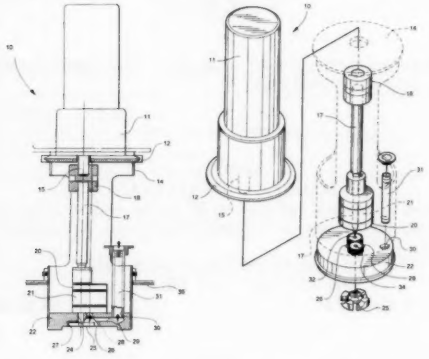
METHOD AND APPARATUS FOR PRECISION METERING OF HIGH VISCOSITY MATERIALS

Mark Everette Cauthen, Charlotte, N.C., assignor to Mahr Corporation, Charlotte, N.C.

Filed Mar. 31, 1998, Appl. No. 52,359

Int. Cl.[7] F04B *19/24*

U.S. Cl. 417—53 **10 Claims**



1. In a gear pump having a material inlet, at least first and second cooperating material pumping gears and a material outlet, the improvement comprising material feeding means positioned upstream from the material inlet for feeding high viscosity material under positive pressure into said material inlet, said gear pump including a motor for driving said material feeding means, and said material feeding means comprises an impeller, and said impeller and said first gear are both driven by said motor.

6,039,546

FLOAT OPERATED PNEUMATIC PUMP TO SEPARATE HYDROCARBON FROM WATER

David H. Edwards, Ann Arbor; Kevin L. Newcomer, Monroe, and K. Lynn Niehaus, Manchester, all of Mich., assignors to QED Environmental Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of application No. 08/721,866, Sep. 27, 1996, abandoned. This application Sep. 29, 1997, Appl. No. 939,775.

Int. Cl.[7] F04B *53/00;* **F04F** *1/06*

U.S. Cl. 417—61 **24 Claims**

1. A pneumatic pump which separates a first and second fluid within a well, where the first and second fluid each have a specific gravity and the specific gravity of the second fluid is less than the specific gravity of the first fluid, comprising:

an outer tube forming an outer chamber therein;

an inner tube forming an inner chamber therein, the inner tube disposed within the outer chamber of the outer tube;

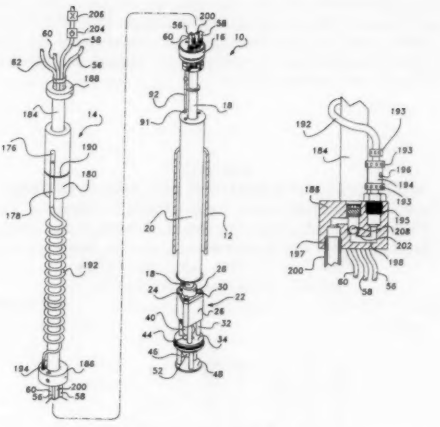
an inlet manifold in proximity to a second end of the inner and outer tubes, the manifold having an internal fluid passage with first and second ends the second end of the fluid passage being connected by a second fluid passage to the outer chamber, the inlet manifold having a valve to enable fluid flow in a first direction from the first end of the fluid passage to the outer chamber and inhibiting fluid flow in an opposite direction;

a well float having a floating fluid inlet disposed in proximity to an interface between the first and second fluids and having a specific gravity such that the well float floats in both the first and second fluids and the inlet remains in proximity to the interface between the first and second fluids, the float including the floating fluid inlet formed thereon for receiving at least one of the first and second fluids;

the conduit providing fluid passage between the floating fluid inlet and the first end of the internal fluid passage;

a fluid separator at a first end of the outer tube, the separator defining a fluid passage between the inner and outer chambers, where in a first configuration, the first fluid exits the pump from the outer chamber while the second fluid remains within the outer chamber, and in a second configuration, the first fluid is sealed from entering the pump from an area exterior to the pump and the second fluid may be discharged from the pump; and

a discharge housing to exhaust air from the pump to enable entry of fluid into the outer chamber and to introduce air into the pump to enable discharge of fluid from the outer chamber via the inner chamber, the discharge housing also having a fluid passage to communicate fluid from the inner chamber of the pump.



6,039,547

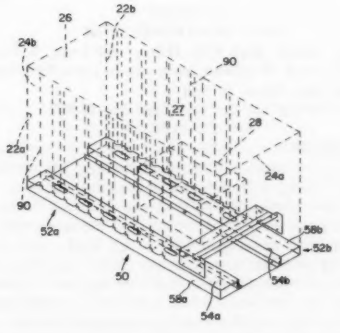
COMPRESSOR WITH COMPRESSOR BASE THAT INCLUDES FLUID SUPPLY OPENINGS

Dean P. Hendrix, Mocksville, and David F. Rowe, Jr., Advance, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Provisional application No. 60/057,488, Sep. 4, 1997. This application Sep. 4, 1998, Appl. No. 149,157.

Int. Cl.[7] F04B *53/00*

U.S. Cl. 417—234 **8 Claims**



1. A compressor, comprising: a base; a housing supported on said base, said housing and base defining a compression chamber;

and a compression module supported on said base within said compression chamber, said base including at least two support channels, each of the at least two support channels including a first group of flow openings for supplying a volume of uncompressed fluid to the compression module.

6,039,548

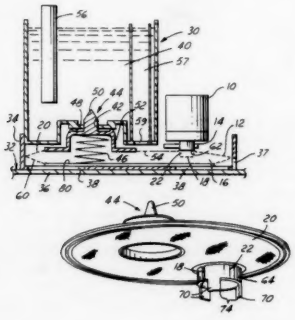
FUEL PUMP WITH CONTROLLED VAPOR INTAKE

Wayne A. Ley, Middletown, Conn.; David E. Mroczka, Port Washington, N.Y., and Edward J. Talaski, Caro, Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed May 22, 1998, Appl. No. 83,300

Int. Cl.[7] **F04B** *39/06;* **F02M** *37/00*

U.S. Cl. 417—313 **13 Claims**



1. A fuel pump module to be disposed within a fuel tank comprising:

a fuel pump having an inlet through which fuel is drawn into the fuel pump and an outlet through which fuel is delivered under pressure;

a filter disposed adjacent to the bottom of the tank and having an upper wall and a lower wall defining an enclosure communicating with the fuel pump inlet for drawing fuel from the tank through the filter and into the fuel pump inlet;

at least one vapor inlet within the enclosure disposed above and communicating with the fuel pump inlet, and having a smaller flow area than the fuel pump inlet flow area whereby large fuel vapor bubbles within the enclosure adjacent the filter upper wall are divided into smaller vapor bubbles upon passing through the vapor inlet to reduce and limit the maximum amount of fuel vapor drawn into the fuel pump at one time.

6,039,549

VOLUTE COMPRESSOR

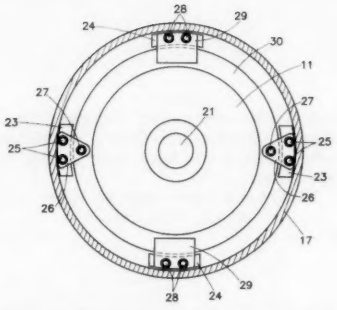
Guang-Der Tarng, Hsin Chu Hsien, and Lung-Tsai Chang, Hsin Chu, both of Taiwan, assignors to Rechi Precision Co., Ltd., Taoyuan Hsien, Taiwan

Filed Apr. 2, 1998, Appl. No. 53,685

Int. Cl.[7] **F01C** *1/02*

U.S. Cl. 418—55.5 **5 Claims**

1. A volute compressor comprising a housing, a frame mounted inside said housing, a fixed volute coupled to said frame at a top side, and a rotary volute mounted on said frame and defining with said fixed volute a plurality of compression chambers, wherein said frame comprises a plurality of first locating blocks and a plurality of second locating blocks at a top side thereof, said first locating blocks and said second locating blocks being spaced around said fixed volute and said rotary volute; a plurality of spring plates are connected between said first locating blocks and a shoulder of said fixed volute to stop said fixed volute from rotary motion relative to said rotary volute; a plurality of stop plates are fixedly mounted on said second locating blocks, said stop plates each having a free end



suspending above the shoulder of said fixed volute to limit upward movement of said fixed volute.

6,039,550

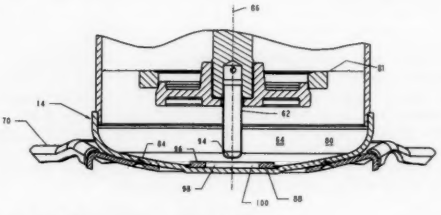
MAGNETIC DEBRIS TRAP

Vernon E. Friedley, and Thomas R. Barito, both of Arkadelphia, Ark., assignors to Scroll Technologies, Arkadelphia, Ak.

Filed Jul. 18, 1997, Appl. No. 896,446

Int. Cl.[7] **F04C** *29/02;* **F01M** *1/10*

U.S. Cl. 418—55.6 **6 Claims**



1. A sealed compressor, comprising:

an enclosure including a center shell extending along an axial length, and sealed at one end by an end cap, said end cap being welded to said center shell;

an electric motor housed within said center shell, and receiving a driveshaft extending along a drive axis;

a compressor pump unit mounted adjacent one end of said motor spaced from said end cap, and being connected to be driven by said driveshaft; and

a lubrication system to transfer lubricant within said sealed compressor through said driveshaft and to said compressor pump unit, a magnet being held on said end cap by holding structure being positioned radially outwardly of said magnet, and said magnet being generally centered on said rotational axis of said driveshaft.

6,039,551

GEAR PUMP FOR USE IN AN ELECTRICALLY-OPERATED SEALED COMPRESSOR

Yoshiharu Takeuchi; Kiyoji Aburaya, both of Otsu; Toshiharu Yasu, Yasu-gun; Masahiro Tsubokawa; Manabu Sakai, both of Kusatsu; Shoji Aoshika, Otsu, and Tsutayoshi Narita, Omihachiman, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

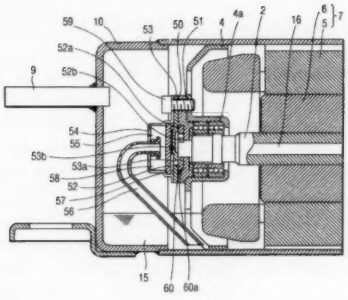
Filed May 28, 1997, Appl. No. 864,614

Claims priority, application Japan, Jun. 7, 1996, 8-145379

Int. Cl.[7] **F04C** *29/02*

U.S. Cl. 418—88 **14 Claims**

1. A gear pump for use in an electrically-operated sealed compressor including a compression mechanism, an electric motor for



driving the compression mechanism, and a crankshaft for transmitting a rotational force of the electric motor to the compression mechanism, said gear pump comprising:

a first gear connected to an end of the compressor crankshaft;

a second gear in mesh with said first gear;

a strainer for capturing foreign substances contained in oil which is introduced to said first gear and said second gear; and

a pump cover for covering said strainer, said pump cover having a shoulder portion in which said strainer is received, said strainer having a height greater than that of said shoulder portion so that said strainer protrudes from one end surface of said pump cover.

6,039,552

ROTARY COMPRESSOR

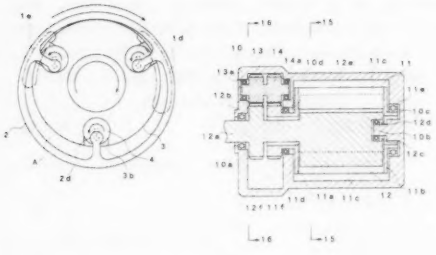
Kenji Mimura, 29-1105, Wakabadai 4-chome, Asahi-ku, Yokohama-shi, Kanagawa 241-0801, Japan

Filed Mar. 9, 1998, Appl. No. 36,786

Claims priority, application Japan, Mar. 11, 1997, 9-055797

Int. Cl.[7] F01C *1/10*

U.S. Cl. 418—166 **5 Claims**



1. A rotary compressor comprising a casing having an inflow port and an outflow port for a fluid which open on its inner surface, a cylindrical outer rotor rotatably housed in the casing, and a cylindrical inner rotor rotatably supported at an eccentric position within the outer rotor, said rotors being rotated in a predetermined direction to introduce a fluid from the inflow port into a space between the rotors, the fluid being discharged through the outflow port, wherein:

said outer rotor has an inner peripheral surface provided with at least one or more protruding portions for partitioning which are radially inwardly raised and are circumferentially spaced apart from one another;

said inner rotor has an outer peripheral surface provided with at least one or more recessed portions for partitioning which are radially inwardly recessed and are circumferentially spaced apart from one another; and

said outer rotor and said inner rotor are connected to each other in such a manner that said protruding portions for partitioning of said outer rotor move circularly in a non-contact manner along inner surfaces of said recessed portions for partitioning of said inner rotor.

6,039,553

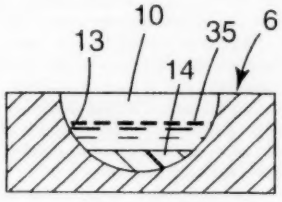
APPARATUS FOR MOLDING LIGHT EXTRACTION STRUCTURES ONTO A LIGHT GUIDE

David J. Lundin, Woodbury, and Kevin M. Eliason, St. Paul, both of Minn., assignors to 3M Innovative Properties Company, St, Paul, Minn.

Filed Dec. 2, 1998, Appl. No. 203,948

Int. Cl.[7] B29C *33/42*

U.S. Cl. 425—115 **17 Claims**



12. A system for continuously fabricating an illumination device, comprising:

a) a source for supplying continuous lengths of light guide;

b) a movable endless segmented mold assembly including a plurality of open mold segments coupled together to form the endless segmented mold assembly, each of the plurality of open mold segments rotating about an axis that is perpendicular to the length of the light guide, contacting the light guide after the light guide exits the source during a portion of the rotation, wherein each of the plurality of open mold segments includes:

(i) an inner surface having a cross sectional shape that matches at least a portion of a desired outer surface cross sectional shape of the overlay of the light guide;

(ii) at least one microstructure having a shape that is a replica of a desired light extraction structure; and

(iii) a reservoir having a volume sufficient to admit the light guide and a curable material such that when the curable material is added to the reservoir the curable material completely submerges the microstructure; and

c) a container of curable material fluidically coupled to a reservoir of one of the plurality of open mold segments when the one of the plurality of open mold segments contacts the light guide.

6,039,554

MOLDING APPARATUS FOR PRODUCING SOLIDIFIED ARTICLES

Tokuji Akutagawa, Tokyo, Japan, assignor to Akutagawa Confectionery Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1996, Appl. No. 767,368

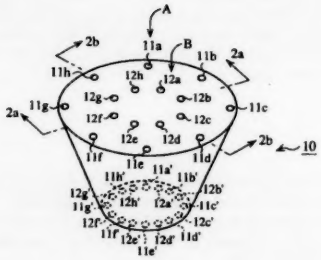
Int. Cl.[7] B29C *45/16*

U.S. Cl. 425—130 **8 Claims**

1. A molding system for use in producing a solidified article having a predetermined composite pattern formed of at least two kinds of viscous fluids distinct from each other in color, said system comprising:

a unit mold for molding a single solidified article,

at least one discrete passage per each of said viscous fluids for separately guiding each of the viscous fluids to said unit mold for forming said single solidified article, said each of the



viscous fluids having been measured separately to have a predetermined amount,

each of said discrete passages having at least one discrete passage inlet and at least one discrete passage outlet, each of said at least one discrete passage outlet discharging said viscous fluid guided through the discrete passage,

said discrete passage outlets being arranged in a single plane facing the unit mold, and

at least one uniting passage in communication with said discrete passage outlets discharging at least two kinds of the viscous fluids among all of said discrete passage outlets to unite the viscous fluids discharged therefrom,

said at least one uniting passage having a plate having at least one orifice therein for passing the viscous fluids, said plate being disposed in the middle of the uniting passage in a plane transverse to a flow direction of the viscous fluids through the uniting passage,

said at least one uniting passage having at least one uniting passage outlet provided at one end of said at least one uniting passage, said at least one uniting passage outlet facing said unit mold,

said unit mold receiving said viscous fluids discharged through said outlets to mold a single solidified article.

6,039,555

LIQUID-PERMEABLE TOPSHEET FOR BODY EXUDATES ABSORBENT ARTICLE, APPARATUS AND METHOD FOR MANUFACTURING SAME

Tomoko Tsuji, Kagawa-ken; Hisashi Takai, Ehime-ken, and Hiroki Goda, Kagawa-ken, all of Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Division of application No. 08/808,404, Feb. 28, 1997. This application Oct. 26, 1998, Appl. No. 178,817.

Claims priority, application Japan, Feb. 29, 1996, 8-43223; Feb. 29, 1996, 8-43224

Int. Cl.[7] B29C *43/32;43/44;43/46*

U.S. Cl. 425—362 **3 Claims**

1. An apparatus for manufacturing a liquid-permeable topsheet for body exudates absorbent article comprises:

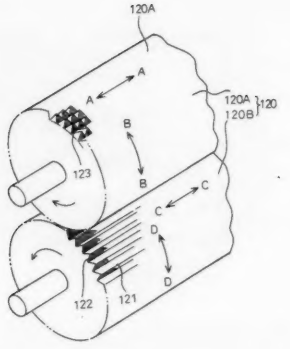
a pair of mutually engageable embossing elements for an embossing treatment of a continuous composite sheet web composed of a liquid-permeable nonwoven fibrous sheet of thermoplastic synthetic resin and a plurality of filaments of thermoplastic synthetic resin extending in one direction parallel to one another and continuously bonded to an upper surface of the nonwoven fibrous sheet;

the embossing elements including a first roll and a second roll;

the first roll being provided on a circumferential surface thereof with cones arranged in a plurality of lines, extending in an axial direction thereof as well as in a circumferential direction thereof;

the second roll being provided on a circumferential surface thereof with crests of an inverted V-shaped cross-section and troughs of a V-shaped cross-section arranged in a plurality of lines in an axial direction thereof so that the crests and troughs are alternatively arranged in a circumferential direction thereof; and

wherein a line of the cones of the first roll arranged in the axial direction thereof is received by the corresponding trough of the second roll while the crest of the second roll is received between two lines of cones which are adjacent to each other in the circumferential direction thereof.



6,039,556

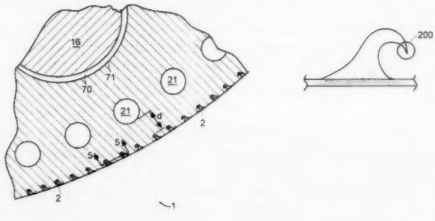
STACKABLE MOLD PLATES HAVING ARRAYS OF LASER-CUT MOLD SURFACES AT THEIR EDGES

Stephen C. Jens, Winchester; Andrew C. Harvey, Waltham, and Richard M. Formato, Shrewsbury, all of Mass., assignors to Velcro Industries B.V., Curacao, Netherlands Antilles

Continuation-in-part of application No. 08/786,226, Jan. 21, 1997. This application Sep. 10, 1997, Appl. No. 926,517.

Int. Cl.[7] B29C *33/42;43/46*

U.S. Cl. 425—363 **19 Claims**



1. A mold plate formed from flat plate stock, having an array of laser-cut mold surfaces at an edge of the mold plate for forming, together with cooperating surfaces, molding cavities shaped to form respective molded fastener elements of a touch fastener product,

at least many of the mold surfaces each forming a point, extending into material of the plate, having a radius of less than about 0.001 inch.

6,039,557

APPARATUS FOR MAKING GAS-FILLED VESICLES OF OPTIMAL SIZE

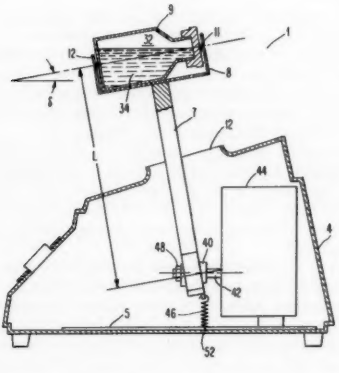
Evan Unger; Thomas McCreery; David Yellowhair, and Terrence R. Barrette, all of Tucson, Ariz., assignors to ImaRx Pharmaceutical Corp., Tucson, Ariz.

Division of application No. 08/482,294, Jun. 7, 1995, Pat. No. 5,656,211, which is a continuation-in-part of application No. 08/307,305, Sep. 19, 1994, Pat. No. 5,773,024, which is a continuation-in-part of application No. 08/159,687, Nov. 30, 1993, Pat. No. 5,585,112, which is a continuation-in-part of application No. 08/076,239, Jun. 11, 1993, Pat. No. 5,469,854, said application No. 08/482,294 is a continuation-in-part of application No. 08/160,232, Nov. 30, 1993, Pat. No. 5,542,935, which is a continuation-in-part of application No. 08/076,250, Jun. 11, 1993, Pat. No. 5,580,575, said application No. 08/076,239 and application No. 08/076,250, each is a continuation-in-part of application No. 07/717,084, Jun. 18, 1991, Pat. No. 5,228,446, and application No. 07/716,899, Jun. 18, 1991, abandoned, said application No. 07/717,084 and application No. 07/716,899, each is a continuation-in-part of application No. 07/569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of application No. 07/455,707, Dec. 22, 1989, abandoned. This application Apr. 7, 1997, Appl. No. 833,489.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B01J *13/02*

U.S. Cl. 425—429 **48 Claims**



1. An apparatus for making vesicles, comprising:

a) a container containing an aqueous suspension phase and a gaseous phase substantially separate from said aqueous suspension phase;

b) a device for shaking said container by imparting a reciprocating motion thereto so as to form vesicles, said shaking device comprising (i) an arm having a distal end to which said container is coupled, and (ii) means for pivoting said arm back and forth in first and second mutually perpendicular directions so as to reciprocate said container along an arcuate path, wherein said means for pivoting said arm comprises means for pivoting said arm at a frequency greater than approximately 2800 RPM and no greater than approximately 10,000 RPM.

6,039,558

MOLD FOR INJECTION MOLDING OF A PLASTIC PRODUCT

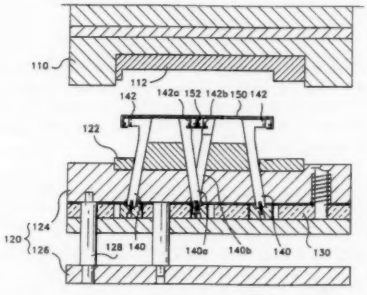
Jong-kwon Park, and Anjai Tsuneji, both of Kwangju, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 14, 1998, Appl. No. 78,518

Claims priority, application Rep. of Korea, Sep. 29, 1997, 97-49629; Nov. 29, 1997, 97-64501

Int. Cl.[7] B29C *45/44*

U.S. Cl. 425—556 **2 Claims**



1. A mold for injection molding of plastic products, the mold comprising:

a fixing plate including a first cavity-forming portion forming a part of a cavity into which a melted plastic is injected so as to be molded;

a moving plate movably disposed on the fixing plate so as to be movable toward and away from the fixing plate and including a second cavity-forming portion cooperating with the first cavity-forming portion so as to form the cavity therewith;

a plurality of molding pins having prominence-depression portions positionable in the cavity for forming undercut portions in a product molded in the cavity, the molding pins slidably passing through the second cavity-forming portion obliquely thereto; and

an eject plate movable relative to the fixing plate and the moving plate and connected to the molding pin so as to slidably move the obliquely arranged molding pins relative to the second cavity-forming portion such that the prominence-depression portions are separated from the respective undercut portions of the molded product;

wherein two of the molding pins cross over one another and have their respective prominence-depression portions facing one another with no part of the cavity-facing portions being situated therebetween, to form on the molded product a partition wall having undercut portions on opposite sides thereof.

6,039,559

APPARATUS FOR DISPLACING A PLASTICIZING AND INJECTION UNIT

Stefan Eppich, Arbing, Austria, assignor to Engel Maschinenbau Gesellschaft m.b.H., Schwertberg, Australia

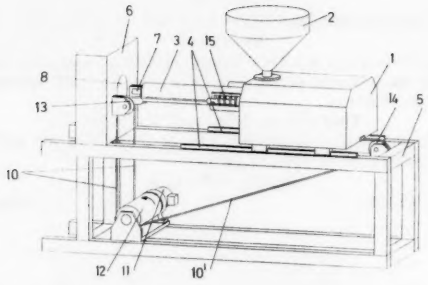
Filed Feb. 27, 1998, Appl. No. 32,559

Claims priority, application Austria, Mar. 5, 1997, 135/97 U

Int. Cl.[7] B29C *45/58*

U.S. Cl. 425—574 **9 Claims**

1. Apparatus for displacing a plasticising and injection unit with respect to a stationary die platen of an injection moulding machine and for producing a contact pressure on a nozzle of said plasticising and injection unit on a mould-half arranged on the stationary die platen, comprising: at least one flexible elongated traction member (**10**, **10'**) connected to the plasticising and injection unit



(1); and drive means engaged with the flexible elongated traction member for applying tractive forces to the plasticising and injection unit (1) for moving the unit away from the mould-half and for moving the unit toward the mould-half and applying the nozzle with force against the mould-half.

6,039,560

LOW NO_x BURNER AND METHOD OF CONTROLLING RECIRCULATION OF EXHAUST GAS

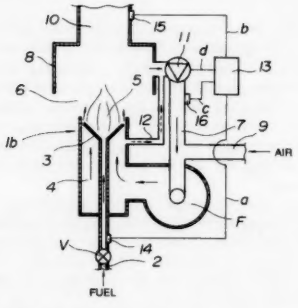
Norikazu Kubota, Gunma-ken, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Jan. 30, 1997, Appl. No. 790,194

Claims priority, application Japan, Jan. 31, 1996, 8-035805

Int. Cl.[7] F23M *3/00;* **F23L** *1/00;* **F23J** *11/00;* **F24H** *3/02*

U.S. Cl. 431—9 **11 Claims**



1. A low NO_x burner comprising:

a burner body comprising a combustion chamber, a nozzle that opens into a burner port that in turn opens into said combustion chamber, a fuel supply passage connected to the nozzle, a blower for supplying air for combustion, an air suction passage extending from an air source to said blower, and an air supply passage for supplying air for combustion that extends from the blower to the nozzle and surrounds the nozzle;

an exhaust-gas chamber into which combustion exhaust gas is introduced from said burner body;

an exhaust-gas duct connected to said exhaust-gas chamber, for conducting exhaust gas to an outlet;

an exhaust-gas recirculation passage for supplying combustion exhaust gas from said burner to said air supply passage, the exhaust-gas recirculation passage having an inlet connected to said exhaust-gas chamber and an outlet connected to said air suction passage;

an exhaust-gas recirculation fan provided within said exhaust-gas recirculation passage, to forcibly recirculate exhaust gas from said exhaust-gas chamber to said air supply passage;

a bypass passage formed between said exhaust-gas recirculation passage and said air supply passage, one end of said bypass passage connecting to said exhaust-gas recirculation passage upstream of said exclusive exhaust-gas recirculation fan;

a fuel flow meter and a fuel flow adjustment valve in said fuel supply passage;

a NO_x sensor in said exhaust-gas duct;

a flow rate meter in said exhaust-gas recirculation passage, for detecting the quantity of exhaust gas recirculated; and

a control unit for controlling said exhaust gas recirculation fan.

6,039,561

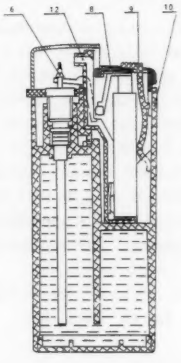
SAFETY PIEZO-ELECTRIC LIGHTER

Hou Chong Lei, Covina, Calif.

Filed Feb. 23, 1998, Appl. No. 28,107

Int. Cl.[7] F23D *11/36*

U.S. Cl. 431—153 **1 Claim**



1. A safety piezo-electric lighter of the type comprising:

a. a hollow body including a reservoir for gas fuel;

b. ignition means provided at one end of the body, the ignition means including:

A. a valve mechanism in fluid connection with the reservoir and operable for selectively discharging gas fuel stored in the reservoir through the valve mechanism;

B. gas-release means connected to the valve mechanism and supported by means on the housing to be movable relative to the housing between a first position where gas is not discharged through the valve mechanism and a second position where gas is discharged through the valve mechanism; and

C. a safety ignition mechanism connected to the gas-release means for igniting the gas fuel discharged through the valve mechanism, wherein the safety ignition mechanism comprises of

i. a thumb-piece connected to the gas release means and slidably supported to move relative to said body and attached to the safety mechanism, said thumb-piece having a horizontal upper surface and a vertical surface, a horizontal slit through the thumb-piece horizontal surface and a longitudinal slit formed through the thumb-piece vertical surface;

ii. a one-piece safety device of flexible material attached to the thumb-piece, an upper protrusion of the one-piece safety device is connected to an underside surface of the thumb piece and is slidably supported along said horizontal slit and includes an operating surface which is exposed on the horizontal upper surface so as to be engaged by a user's thumb during operation of the safety ignition mechanism, said one-piece flexible safety device includes a lower portion positioned in a space defined between the body and the underside of the thumb-piece, a second protrusion formed on a middle portion of said one-piece safety device, said second protrusion arranged to slidably engage the longitudinal slit on the vertical surface of the thumb-piece such that when the safety device is in a locked position, located in the vertical

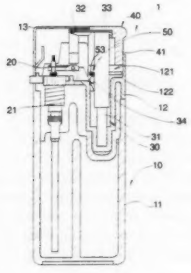
longitudinal slit and positioned between a lower portion of the thumb-piece and an upper portion of the body, so as to block movement of the thumb-piece relative to the body and therefore prevent operation of the gas release means, and the lower portion of the one-piece safety device is formed in an S-shape that is secured in the body to cause a force on the middle portion and the upper portion of the one-piece safety device for biasing the middle portion to the locked position.

6,039,562

PIEZOELECTRIC LIGHTER WITH SAFETY LOCK

Kin Chung Li, 2749 S. Cardillo Ave., Hacienda Heights, Calif. 91745

Filed Jun. 11, 1999, Appl. No. 332,300
Int. Cl.[7] F23D *11/36*
U.S. Cl. 431—153 **18 Claims**



1. A piezoelectric lighter, comprising:

a casing having a liquefied gas storage and a piezoelectric unit casing affixing on top of said liquefied gas storage and defining a pusher cavity therein, wherein at least a locking hole, communicating said pusher cavity with outside, is provided on a first side wall of said piezoelectric unit casing;

a gas ejection nozzle appearing from a ceiling of said casing and communicating with said liquefied gas storage for controlling flow of gas;

a piezoelectric unit, which is fitted in said casing, having a movable operating part extended through said pusher cavity for generating piezoelectricity, and an ignition tip connected thereto;

a pusher cap slidably fitted in said pusher cavity of said casing in a vertically movable manner, exposing a top portion thereof above said casing and being attached to a top end of said piezoelectric unit, wherein an unlocking groove is between an inner side of a bottom portion of said pusher cap and said piezoelectric unit; and

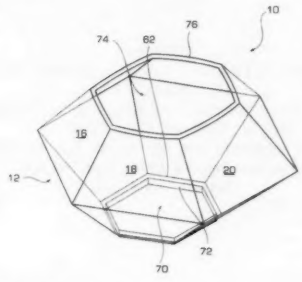
a spring lock unit, which is disposed inside said pusher cavity, comprising a locking heel extended upwardly, a release button sidewardly extended from said locking heel through said locking hole until a pressing end thereof exposed outside, and a spring member integrally extended from said locking heel to another side wall of said piezoelectric unit casing so as to urge said locking heel positioning in a locking condition to block said downward movement of said pusher cap so as to prevent any lighting operation of said piezoelectric unit, wherein to ignite said piezoelectric lighter, said release button is pressed inwards to push said locking heel inwardly to an unlocking condition where said locking heel is aligned with said unlocking groove of said pusher cap, so as to enable said pusher cap to be simultaneously push down to press said moveable operating part of said piezoelectric unit.

6,039,563

STACKABLE HEXAGONAL CANDLE HOLDERS

Christopher Hardy, Springfield, Ill., assignor to Design Ideas, Ltd., Springfield, Ill.

Filed Dec. 23, 1998, Appl. No. 219,523
Int. Cl.[7] F23D *3/16*
U.S. Cl. 431—291 **11 Claims**



1. A candle holder, comprising:

a first set of flat panes joined edge to edge to form an upwardly facing annulus, said upwardly facing annulus comprising an upper edge defining a first plane with an upwardly facing opening therethrough;

a second set of flat panes joined edge to edge to form a downwardly facing annulus, said downwardly facing annulus comprising a lower edge defining a second plane with a downwardly facing opening therethrough;

said first annulus and said second annulus being joined together at a third plane; and

a bottom wall closing said downwardly facing opening along said second plane;

said first, second, and third planes being substantially parallel;

the angles that each of said panes of said first and second set of flat panes forms with any one of said planes being equal to each other; and

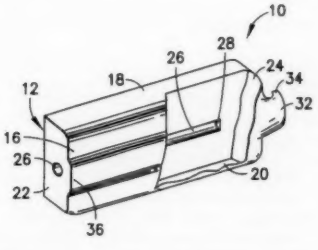
wherein said first set of flat panes and said second set of flat panes are joined so as to form a fixed, unitary structure.

6,039,564

BUCCAL SHEATH AND IMPROVED ORTHODONTIC SYSTEM AND METHOD USING SAME

Paul P. Hendrick, 233 Tremont Park Dr. SE., Lenoir, N.C. 28645-4628

Filed Apr. 5, 1999, Appl. No. 287,220
Int. Cl.[7] A61C *3/00*
U.S. Cl. 433—17 **18 Claims**



1. An orthodontic appliance for attachment to the buccal side of a molar of a patient in need of alignment or movement of teeth of the patient, the orthodontic appliance comprising a buccal sheath, said buccal sheath comprising:

a body member having a base surface for fixedly attaching to the buccal side of a molar of the patient and a generally medially spaced slot in the body member, the slot commencing at an

anterior end surface of the body and continuing a longitudinal distance through the body member and terminating in a position short of an opposite posterior end surface of the body for receiving and retaining an orthodontic wire member for permitting anterior-posterior movement of teeth and/or lateral expansion of the palatal arch of the patient.

6,039,565

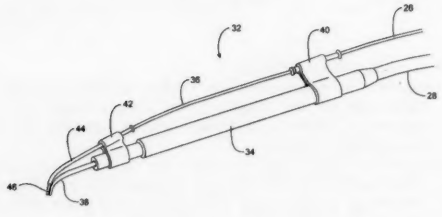
COMBINED ULTRASONIC AND LASER DEVICE AND METHOD OF USE

Marilyn M. Chou; Herrick Tam; King J. J. Yu, and Ken T. Yu, all of 900 Alice St., Oakland, Calif. 94607

Provisional application No. 60/035,093, Jan. 14, 1997. This application Jan. 14, 1998, Appl. No. 6,922.

Int. Cl.[7] A61C *1/07*

U.S. Cl. 433—29 **22 Claims**



1. Apparatus comprising:

a source of laser radiation;

a source of ultrasonic vibration;

means for directing the laser radiation and the ultrasonic vibration onto a common target area; and

a mode switch for selecting between three modes of operation: laser energy only, ultrasonic energy only and combined laser and ultrasonic energy for simultaneously directing laser energy and the ultrasonic energy onto the common target area.

6,039,566

METHOD OF PRODUCING DENTURES AND ARTICULATOR FOR USE THEREWITH

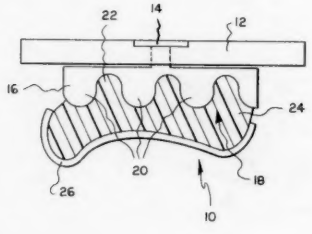
Hanspeter Foser, Balzers, Liechtenstein, assignor to Ivoclar AG, Schaan, Liechtenstein

Filed Sep. 1, 1998, Appl. No. 145,070

Claims priority, application Germany, Sep. 8, 1997, 197 39 220

Int. Cl.[7] A61C *11/00*

U.S. Cl. 433—60 **15 Claims**



14. An articulator comprising:

a retention member including a base (**16**) provided with a plurality of raised portions (**20**) for the detachable engagement with a particular elastic material (**24**) that is carried by a denture plate (**26**) so that the denture plate and elastic material may be removed from the base without destroying it.

6,039,567

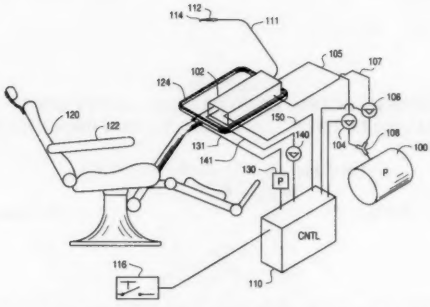
ARRANGEMENT FOR FEEDING ABRASIVE DENTAL POWDER

John D. Abbott, Redwood City, and Arthur Vassiliadis, Dana Point, both of Calif., assignors to Dove Systems, Inc., Redwood City, Calif.

Filed Feb. 3, 1999, Appl. No. 244,255

Int. Cl.[7] A61C *3/02;* **B24C** *7/00*

U.S. Cl. 433—88 **9 Claims**



1. An arrangement for treating teeth with pressurized abrasive powder comprising:

a pressure vessel with an inlet port, an outlet port, a discharge assembly, and a main pressure chamber holding a supply of abrasive powder;

a source of pressurized gas connected to the inlet port;

a dental abrasion tool connected to the outlet port, the abrasive powder being ejected from the pressure vessel and to the abrasion tool via the discharge assembly and the outlet port;

a feeding and metering auger mounted within the pressure vessel;

a motor that is connected to the auger, the abrasive powder within the pressure vessel being fed to the discharge assembly by motor-driven rotation of the auger;

a pressure transducer sensing an internal pressure in the pressure vessel; and

control means connected to the motor for adjusting a rate of rotation of the motor, and thereby a feed rate of the auger, as a pre-determined function of the internal pressure in the pressure vessel.

6,039,568

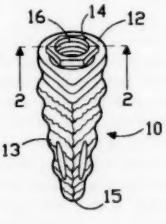
TOOTH SHAPED DENTAL IMPLANTS

Kenneth F. Hinds, 4 Costa Del Sol, Monarch Beach, Calif. 92629

Filed Jun. 2, 1998, Appl. No. 88,911

Int. Cl.[7] A61C *8/00*

U.S. Cl. 433—175 **24 Claims**



1. A dental implant to be implanted into a jawbone to support an abutment and tooth analogue in the shape of an anterior tooth to replace an anterior tooth, comprising:

a. a tapered rounded triangular-shaped implant having an exterior surface, a collar with a top surface, and configured to

taper from the collar to an apex wherein the general cross-section of the implant from the collar to its apex is rounded triangular shape in cross-section;

b. the rounded triangular shaped implant for being embedded into a precut opening in the jawbone wherein the precut opening is the same shape as the rounded triangular shaped implant so that the rounded triangular shaped implant is for being press fitted into the opening with the apex located deepest into the jawbone and the collar is adjacent a gumline or bone; and

c. means for retaining an abutment on the tapered rounded triangular shaped implant and means for retaining the tooth analogue in the shape of an anterior tooth on the abutment;

d. whereby the rounded triangular shaped implant provides an improved structural support and cosmetic fit for the anterior tooth analogue.

6,039,569

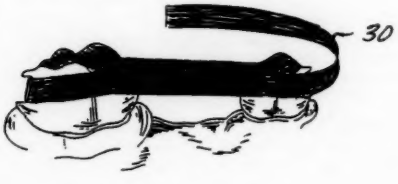
FIBER-REINFORCED DENTAL STRUCTURES AND METHOD OF MANUFACTURE THEREOF

Arun Prasad, Cheshire; Ajit Karmaker, Wallingford; Elie Zammarieh, Milford, and Grant P. Day, Cheshire, all of Conn., assignors to Jeneric/Pentron Incorporated, Wallingford, Conn.

Provisional application No. 60/055,590, Aug. 12, 1997. This application Aug. 7, 1998, Appl. No. 130,911.

Int. Cl.[7] A61C *13/12;13/225;5/08*

U.S. Cl. 433—180 **47 Claims**



39. A dental crown, comprising:

a wrap having reinforcing fibers embedded within polymeric matrix configured to be wrapped around and attached to at least a portion of a natural tooth.

6,039,570

AERATION-CAVITATION DEMONSTRATION CONSOLE

Frank Garner, Lake Orion, and Joseph Klamecki, Attica, both of Mich., assignors to Aeroquip Vickers, Inc., Maumee, Ohio

Filed Jan. 8, 1998, Appl. No. 4,695

Int. Cl.[7] G09B *9/00*

U.S. Cl. 434—126 **9 Claims**

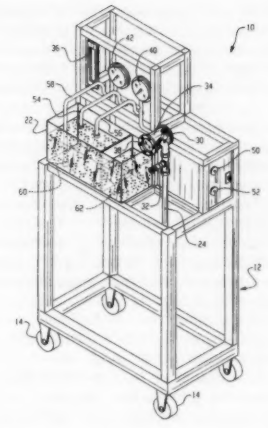
1. A hydraulic demonstration apparatus comprising:

a hydraulic system including a reservoir, an inlet line and an outlet line;

an air valve at the inlet line for introducing air so as to create aeration in the hydraulic system;

a restricting valve at the inlet line for creating cavitation in the hydraulic system;

a hydraulic pump having a clear cover for observing the effects of aeration and cavitation inside the pump; and



a flow meter having a clear housing, for observing the air in the system and the reduction of pump efficiency caused by aeration.

6,039,571

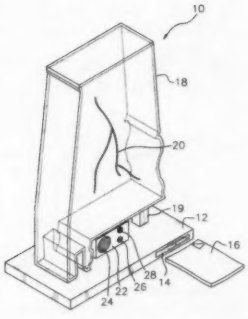
GEOGRAPHICAL AREA TERRARIUM

Lillie Hughes, 4265 Washington Ferry Rd., Montgomery, Ala. 36108

Filed Dec. 11, 1998, Appl. No. 209,807

Int. Cl.[7] G09B *25/06*

U.S. Cl. 434—151 **1 Claim**



1. A terrarium representative of a geographical area comprising, in combination:

a base defined by a top face with a generally planar rectangular configuration, a bottom face with a generally planar rectangular configuration, and a thin periphery formed therebetween and comprising an elongated front face, an elongated rear face, and a pair of short side faces, the front face having a rectangular recess formed therein between the top face and the bottom face and positioned adjacent one of the side faces of the periphery of the base, wherein a study guide may be removably positioned in the recess which contains information regarding the specific geographical area;

an enclosed housing constructed from a transparent material and including a planar front face bounded by a front face peripheral edge, a planar rear face bounded by a rear face peripheral edge aligned with said front face peripheral edge, and a peripheral wall extending between said front face peripheral edge and said rear face peripheral edge and orthogonal to the front face and the rear face wherein the peripheral wall of the housing has a width less than a width of the base a portion of

the peripheral wall being coupled to the base and extending upwardly from the base such that the front face and the rear face of the housing are spaced from a front face and a rear face of the base, respectively, and the front and rear faces of the housing are in parallel relationship, wherein at least one stanchion is coupled to the base and extended upwardly therefrom for supporting the housing, the housing having an interior space with soil, rocks, and foliage situated therein which are commonly found in the geographical area;

indicia positioned on at least one of the front face and the rear face of the housing for representing cities and bodies of water in the geographical region; and

an audio assembly including a housing positioned between the top face of the base and the enclosed housing, a speaker mounted on a front face of the housing for emitting audible sounds upon the receipt of audio signals, a volume dial mounted on the front face of the housing for selectively determining a magnitude of the audible signals, and an actuation button mounted on the front face of the housing for effecting the emission of audible sounds from the speaker representative of information regarding the geographical region upon the depression of the actuation button.

6,039,572

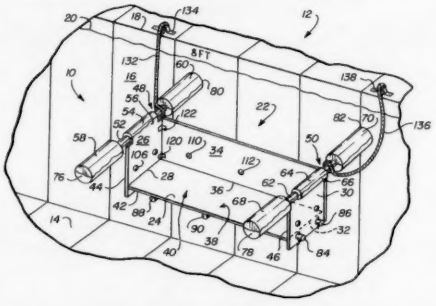
FLOAT PLATFORM FOR AQUATIC INSTRUCTION AND THERAPY

William R. Meier, and Maureen E. Meier, both of Star Rte. 62, Box 18B, Great Barrington, Mass. 01230

Filed Oct. 27, 1998, Appl. No. 179,772

Int. Cl.[7] **A63B** *69/12*

U.S. Cl. 434—254 **17 Claims**



1. A float platform for aquatic instruction and therapy of users of the platform, the float platform comprising:

a. a frame including a base platform, a first end wall secured to a first side of the base platform, a second end wall secured to a second side of the base platform opposed to the first side of the base platform, a back wall secured between the first and second end walls to a back side of the base platform so that the first and second end walls and back wall extend above the base platform and cooperate to partially surround a user support area on the base platform having an unrestricted entry-exit between the first and second end walls above a front edge of the base platform opposed to the back edge of the platform; and,

b. a first flotation arm and a second flotation arm secured to the frame by fastening means for securing the flotation arms to the frame above the base platform so that the flotation arms float top edges of the first and second end walls near a surface of the water wherein the base platform is below the surface of the water, thereby enabling users on the user support area to be partially supported above a surface of the water and enabling users to readily swim into and exit the support area through the unrestricted entry-exit, wherein the fastening means includes a first strut hook defined in a the top edge of the first end wall, a second strut hook defined in the top edge of the second end wall, the first and second strut hooks each being dimensioned to define an interior having a diameter that is about the same diameter as diameters of first and second struts of the first and second flotation arms, the first and second strut hooks each also being dimensioned to define an opening to the interior that is a distance that is slightly shorter than diameters of the first and second struts so that each strut is detachably secured within an interior of each strut hook by elastic compressive forces of the hook.

6,039,573

PORTABLE APPARATUS FOR SIMULATING ULTRASONIC EXAMINATIONS

Jörg Petrick, Berlin, and Michael Stähle, Falkensee, both of Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

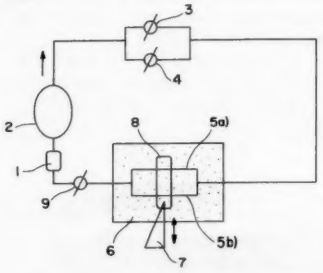
PCT No. PCT/EP96/05855, § 371 Date Jun. 19, 1998, § 102(e) Date Jun. 19, 1998, PCT Pub. No. WO97/23855, PCT Pub. Date Jul. 3, 1997

PCT Filed Dec. 19, 1996, Appl. No. 91,500

Claims priority, application Germany, Dec. 21, 1995, 195 49 240

Int. Cl.[7] **G09B** *23/28*

U.S. Cl. 434—268 **13 Claims**



1. A portable flow model for simulating ultrasound studies, comprising individual components including an injection point (**1**), a pump (**2**), a choke (**3**) to which a clocked valve (**4**) is connected in parallel, a study chamber (**6**) that is equipped with a study window (**8**), and another choke (**9**), whereby the individual components are connected together by a tube system in a closed circuit.

6,039,574

TIME MONITORING PORTABLE GAME SYSTEM

Jocelyn D. Standiford, 5304 Charles St., Racine, Wis. 53402, and Candius L. Edgerle, 4019 N. La., Franksville, Wis. 53126

Filed Mar. 11, 1999, Appl. No. 267,008

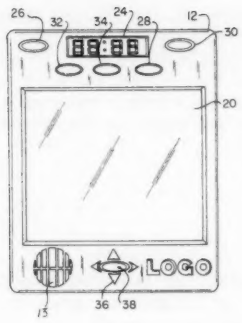
Int. Cl.[7] **G09B** *19/12*

U.S. Cl. 434—304 **9 Claims**

1. A child educational entertainment device comprising, in combination:

a housing having a planar rectangular front face, a planar rectangular rear face and a thin periphery formed therebetween defined by a short top edge, a short bottom edge and a pair of elongated side edges, the rear face having a battery compartment formed therein with a removable cover for allowing selective access to batteries stored therein, one of the side edges having a port formed therein adjacent to the bottom edge for releasably receiving a first end of an adapter the second end of which has a vehicular cigarette lighter plug mounted thereon for being connected to a cigarette lighter port of a vehicle for receiving power therefrom;

a square liquid crystal primary display mounted on the front face of the housing and spaced from the top edge and the bottom



edge thereof, the liquid crystal primary display having a light for illuminating the same upon the actuation thereof;

a light emitting diode digital display mounted on the front face of the housing adjacent to the top edge thereof for displaying numerals representative of a clock;

an actuation toggle switch mounted on the front face of the housing for actuating the device upon the depression thereof;

a light actuator button mounted on the front face of the housing for actuating the light of the liquid crystal primary display upon the depression thereof;

a pause button mounted on the front face of the housing;

a clear button mounted on the front face of the housing;

a select button mounted on the front face of the housing;

a plurality of direction buttons mounted on the front face of the housing and positioned between the liquid crystal primary display and the bottom edge of the housing;

an enter button mounted on the front face of the housing and positioned between the direction buttons;

a speaker mounted on the front face of the housing for emitting sound signals upon the receipt thereof; and

control means positioned within the housing and connected between the displays, switch, and buttons, the control means, upon the actuation of the device, adapted to prompt a user to enter an amount of time via the direction buttons with the subsequent depression of the enter button whereafter a decrementing timer is displayed on the digital display counting down from the entered amount of time, wherein the control means is reset and again prompt the user to enter the amount of time upon the simultaneous depression of the clear button and the enter button;

said control means having a plurality of modes of operation and adapted to switch between each of the modes of operation by the depression of the select button, the modes of operation including:

a first mode wherein the control means is adapted to display a matrix on the primary display with a number of columns and rows to define a plurality of spaces, the number of columns equal to a number of hours included with the entered amount of time and each column being representative of one of the hours, the spaces of each of the four rows each representative of a quarter of an hour and having a unique color associated with the row, wherein the spaces of each column are illuminated with the associated color upon the cessation of each quarter of an hour increment as indicated by the decrementing timer depicted on the digital display, wherein the decrementing timer may be paused upon the depression of the pause button and further restarted upon the subsequent depression of the pause button,

a second mode wherein the control means is adapted to display a matrix on the primary display with a number of columns and rows to define a plurality of spaces each having a unique alphabetical letter positioned therein, wherein any one of the spaces may be selected via the direction buttons after which the same may be cleared from the primary display upon the depression of the enter button, wherein the control means transmits a sound signal to the speaker when the enter button is depressed,

a third mode wherein the control means is adapted to display a matrix on the primary display with a number of columns and rows to define a plurality of spaces each having at least one of a shape and a color positioned therein, wherein any one of the spaces may be selected via the direction buttons after which the same may be cleared from the primary display upon the depression of the enter button, wherein the control means transmits a sound signal to the speaker when the enter button is depressed,

a fourth mode wherein the control means is adapted to display a matrix on the primary display with a number of columns and rows to define a plurality of spaces each having unique picture positioned therein, wherein any one of the spaces may be selected via the direction buttons after which the same may be cleared from the primary display upon the depression of the enter button, wherein the control means transmits a sound signal to the speaker when the enter button is depressed, and

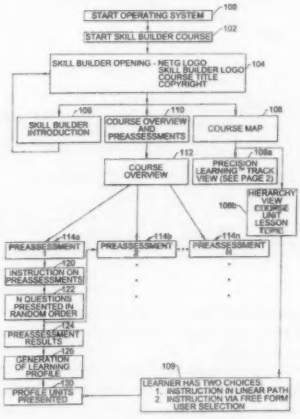
a fifth mode wherein the control means is adapted to display a matrix on the primary display with a number of columns and rows to define a plurality of spaces each having unique errand positioned therein, wherein any one of the spaces may be selected via the direction buttons after which the same may be cleared from the primary display upon the depression of the enter button, wherein the control means transmits a sound signal to the speaker when the enter button is depressed.

6,039,575

INTERACTIVE LEARNING SYSTEM WITH PRETEST

James J. L'Allier, Batavia; Sally H. Welsh, Naperville; Boyd W. Nielsen, Batavia; Kurt W. Miles; Ken L. Myers, both of Naperville; Stephen P. Henrie, Woodridge; Michael I. Norberg, Downers Grove, and Laura I. Helliwell, Naperville, all of Ill., assignors to National Education Corporation, Naperville, Ill.

Filed Oct. 24, 1996, Appl. No. 738,038
Int. Cl.[7] **G09B** *7/00*
U.S. Cl. 434—323 **7 Claims**



1. A computer based method of automatically providing a paperless, individualized, learning sequence comprising:

storing in a computer readable database a plurality of questions directed toward assessing an individual's understanding of a selected learning objective for each member of a plurality of different learning objectives;

automatically evaluating the individual by randomly and sequentially selected from the database at least one question

associated with each member of the plurality of learning objectives and displaying each selected question to the individual for a response wherein each response is received and evaluated relative to a predetermined standard before the next question is selected;

accumulating at least some of the results of the evaluations in a computer storage unit in computer readable form;

processing the results to automatically produce a specific sequence of instructional units in response to those responses which varied materially from the respective standard; and

presenting the sequence of instructional units on a display for the individual wherein the individual can interact with each of the units via the display.

5. An apparatus for providing an automatic, paperless, individualized learning sequence to a user comprising:

a programmable processor;

a visual display coupled to the processor;

a unit coupled to the processor, for reading control information and a database from a medium and providing that information to the processor and wherein, in response to that information, the processor accesses the database and wherein the processor includes circuitry for randomly selecting from the database a plurality of assessment questions and circuitry for presenting the plurality of questions to the user on the display;

a user operable input device coupled to the processor, whereby the user provides responses to the processor to at least some of the assessment questions and wherein the processor includes further circuitry for evaluating the responses and in response thereto for establishing a sequence of selected topics for presentation to the user.

6,039,576

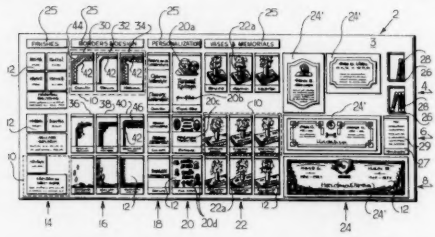
MERCHANDISING SELLING SYSTEM AND DISPLAY UNIT

Joseph A. Gabig, and David B. Jones, both of Allegheny County, Pa., assignors to Matthews International Corporation, Pittsburgh, Pa.

Continuation of application No. 09/019,510, Feb. 5, 1998, Pat. No. 5,882,209, which is a continuation of application No. 08/784,972, Jan. 16, 1997, Pat. No. 5,759,045, Provisional application No. 60/010,121, Jan. 17, 1996. This application Mar. 8, 1999, Appl. No. 264,529.

Int. Cl.[7] **G09B** *25/00*

U.S. Cl. 434—367 **1 Claim**



1. A product display board for display of product lines of memorial products, said display board comprising:

a planar member; and

a plurality of horizontally arranged linear arrays mounted on said planar member, each said array displaying one product line and including a plurality of cells, each said cell including a product sample displaying at least one design feature, said at least one design feature comprising at least one design option for a memorial product, wherein each said at least one design feature is selected from the group consisting of finishes, borders, border decorations, lettering fonts, personalized designations, floral holders and combinations thereof, wherein each said at least one design option comprises a plurality of design options, such that each said cell displaying said at least one design feature is linearly and vertically arranged with another of said cells displaying said at least one design feature, wherein, a plurality of said linearly arranged cells comprise finished product samples, wherein at least one of said arrays displays a product line having a different grade than another of said product lines, whereby a plurality of product lines each having a plurality of design features are displayed.

6,039,577

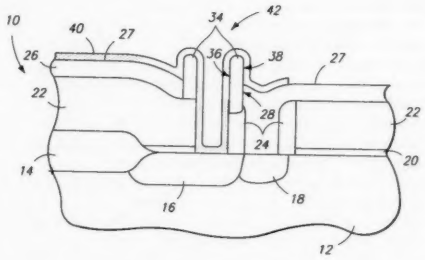
METHOD OF FORMING DIODES

Martin Ceredig Roberts, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/788,617, Jan. 24, 1997, Pat. No. 5,770,496, which is a continuation of application No. 08/409,505, Mar. 23, 1995, Pat. No. 5,635,418. This application Apr. 9, 1998, Appl. No. 58,236.

Int. Cl.[7] **H01L** *21/8234*

U.S. Cl. 437—237 **12 Claims**



1. A semiconductor processing method of forming a back-to-back diode construction, comprising:

providing a circuit node;

forming a first electrically insulative material outwardly of the node;

forming an opening in the first electrically insulative material over the node, the opening having an opening width and sidewalls;

forming a second electrically insulative material outwardly of the first material and within the opening to a thickness which is less than one-half the opening width to less than completely fill the opening with second electrically insulative material, the first and second materials being selectively etchable relative to one another;

anisotropically etching the second material to form a substantially vertically extending sidewall spacer within the opening and to outwardly expose an upper surface of the first material adjacent the sidewall spacer, the sidewall spacer having an inner lateral surface and an outer lateral surface;

removing a portion of the first material to outwardly expose at least a portion of the sidewall spacer outer lateral surface;

providing a conformal layer of a semiconductive material over the exposed outer lateral sidewall spacer surface and over the inner lateral sidewall spacer surface within the opening to define a container shape of semiconductive material within the opening, the container shape making electrical connection with the circuit node; and

doping the conformal layer to define two discrete doped regions separated by an intervening region, the doped conformal layer comprising back-to-back diodes.

6,039,578

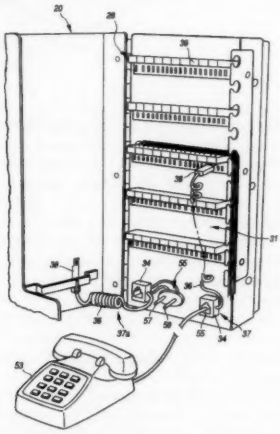
NETWORK INTERFACE DEVICE FOR LINE TESTING

Louis Suffi, Willow Springs, and Arnold M. Ladd, Des Plaines, both of Ill., assignors to Reltec Corporation, Mayfield Heights, Ohio

Provisional application No. 60/015,398, Apr. 2, 1996. This application Mar. 25, 1997, Appl. No. 825,144.

Int. Cl.[7] H04M *1/24*

U.S. Cl. 439—54 **5 Claims**



1. An interface test assembly for use in a telephone communication network including an incoming central office cable and outgoing customer telephone lines comprising:

a housing;

the housing including at least one terminal block assembly having at least one telephone line interconnect element for selectively interconnecting the incoming central office cable to at least one of the outgoing customer telephone lines;

a normally inactive receptacle element fixedly mounted in the housing and coupled to a plug member;

the plug member is positioned adjacent the terminal block assembly in the housing and is structured and dimensioned to be individually coupled to a selected one of the telephone line interconnect elements of the terminal block assembly to disconnect interconnection through the selected telephone line interconnect element between the incoming central office cable and an outgoing customer telephone line thereby isolating the incoming central office cable from the selected outgoing customer line while simultaneously causing the normally inactive receptacle element coupled to the plug member to be activated enabling testing of the incoming central office cable for default conditions by coupling a test device to the receptacle element;

the receptacle element remaining inactive until the plug member is coupled to at least one of the telephone line interconnect elements of the terminal block assembly.

6,039,579

SEALED SOCKET ASSEMBLY FOR A PLUG-IN LAMP AND A METHOD FOR ASSEMBLING SAME

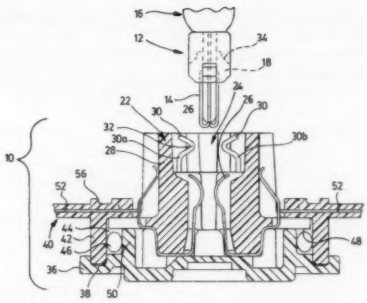
Donald C. Paul, Downers Grove; Joseph C. Bennett, Lisle; Joseph A. Bettini, Naperville, all of Ill., and Edward J. Gordon, Grand Blanc, Mich., assignors to Tricon Industries, Incorporated, Lisle, Ill.

Division of application No. 08/603,874, Feb. 22, 1996, Pat. No. 5,800,183. This application Jul. 24, 1998, Appl. No. 121,935.

Int. Cl.[7] H01R *9/09*

U.S. Cl. 439—56 **4 Claims**

1. A method for assembling a sealed plug-in lamp assembly, the method comprising the steps of:



providing a lamp having a plurality of electrical leads extending therefrom;

providing a lamp socket having a plurality of electrical contacts; said contacts include a plurality of end portions within the lamp socket, and extending around to an exterior of the lamp socket to rest against a vertical sidewall of the lamp socket;

inserting the lamp into the lamp socket providing electrical connection between the plurality of electrical leads and the plurality of end portions of the contacts within the interior of the lamp socket;

providing a circuit carrier having a plurality of sealed circuits molded into the circuit carrier; and

inserting the lamp socket into the circuit carrier providing electrical connection between the plurality of contacts resting against the vertical side wall and the plurality of sealed circuits in a sealed manner.

6,039,580

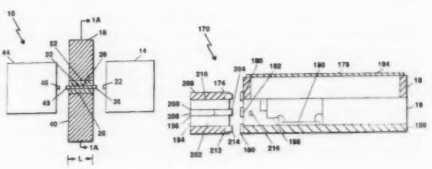
RF CONNECTOR HAVING A COMPLIANT CONTACT

William A. Sciarretta, Lexington; Paul Setzco, Wellesley, and James D. Arangio, Saugus, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 16, 1998, Appl. No. 116,839

Int. Cl.[7] H01R *9/09*

U.S. Cl. 439—63 **17 Claims**



1. An RF system comprising:

an RF element having at least one conductive pad and a ground pad; and

an RF connector comprising:

a conductive support having at least one aperture;

an electrical insulator disposed within said aperture of said conductive support and having an aperture,

a conductive contact having a portion disposed within said aperture of said electrical insulator and a compliant end adjacent to an end of said aperture and capable of being compressed when said compliant end contacts said conductive pad of said RF element; and

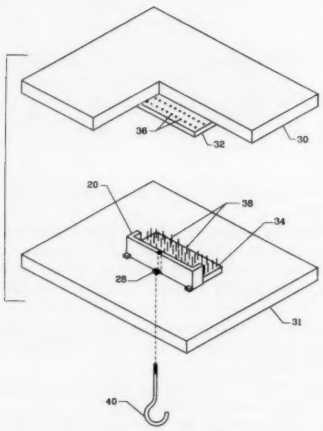
a compliant conductive member disposed concentrically around said conductive contact and electrically insulated from said conductive contact by said electrical insulator, wherein said compliant conductive member contacts said ground pad of said RF element when said compliant end of said conductive contact contacts said conductive pad of said RF element.

6,039,581

ELECTRICAL CONNECTOR FOR CIRCUIT CARD ASSEMBLIES

Mario DiMarco, Scottsdale, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1997, Appl. No. 773
Int. Cl.[7] H01R *9/09;* **H05K** *1/00*
U.S. Cl. 439—74 **8 Claims**



1. An apparatus for providing an electrical connection between parallel mounted first and second circuit card assemblies comprising:

a male electrical connector with a plurality of electrical connection pins extending therefrom, wherein said male electrical connector is in mechanical and electrical connection with the first circuit card assembly;

a female electrical connector with a plurality of electrical connection holes for receiving the electrical connection pins, wherein said female electrical connector is in mechanical and electrical connection with the second circuit card assembly; and

a connector guide attached to the first circuit card assembly adjacent to the male electrical connector which contacts the female connector during the electrical connection of the male and female connectors and provides a guide for inserting the connector pins into the connector holes, wherein the guide has a threaded hole formed therein which is aligned with a hole through the first circuit card assembly, wherein said hole in the guide and said hole in the first circuit card assembly are configured to receive a threaded tool inserted in both the holes until the tool contacts the second circuit card assembly and pushes the first and second circuit card assemblies apart.

6,039,582

DISCHARGE LAMP BALLAST HOUSING WITH SOLDERLESS CONNECTORS

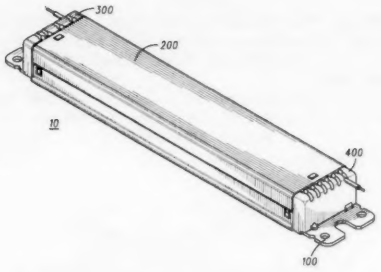
David G. Geis, Niles; Peter Doikas, Arlington Heights, and Jeffrey Demonaco, West Dundee, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1998, Appl. No. 163,818
Int. Cl.[7] H01R *9/09*
U.S. Cl. 439—76.1 **23 Claims**

1. A housing for a gas discharge lamp ballast, comprising:

a base for mounting a circuit board thereon, the base including an input end, an output end opposite the input end, a left end adjacent to the input and output ends, and a right end opposite the left end and adjacent to the input and output ends, wherein:

(i) the left and right ends include edges having a thickness substantially less than that of the rest of the base; and



(ii) the input and output ends of the base each include at least one aperture defined therein;

a cover having a top side, a left side at approximately right angles with the top side, and a right side at approximately right angles with the top side and remote from the left side, wherein the cover has an input end and an output end each having at least one aperture therein, the left and right sides each including a channel therein for mating with the edges on the left and right ends of the base;

an input connector adapted to serve as a first end-cap of the housing, the input connector including a plurality of receptacles for receiving input wires and a plurality of tabs for mating with the corresponding apertures in the input ends of the base and cover; and

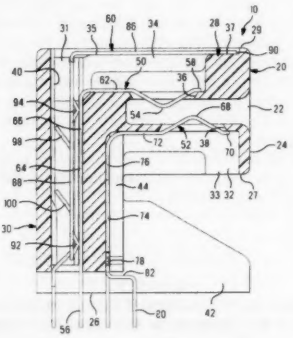
an output connector adapted to serve as a second end-cap of the housing, the output connector including a plurality of receptacles for receiving output wires and a plurality of tabs for mating with the corresponding apertures in the output ends of the base and cover.

6,039,583

CONFIGURABLE GROUND PLANE

Iosif Korsunsky, Harrisburg; Dimitry Grabbe, Middletown; Alex Hasircoglu, Columbia; Richard Schroepfer, Thompsontown, and Daniel Robert Ringler, Elizabethville, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 18, 1998, Appl. No. 40,680
Int. Cl.[7] H01R *4/66*
U.S. Cl. 439—101 **8 Claims**



1. An electrical connector comprising:

a housing,

a unitary ground plane extending in the housing, and

first contacts in first passages in the housing,

the first contacts comprising a number of signal contacts and a number of ground contacts according to a desired ratio of signal contacts to ground contacts,

the unitary ground plane having projecting unitary contacts engaging selected ones of the first contacts in the first pas-

sages to provide said number of ground contacts according to said desired ratio of signal contacts to ground contacts,

the unitary ground plane extending beside said number of signal contacts in the first passages and providing shielding for said number of signal contacts in said first passages, and

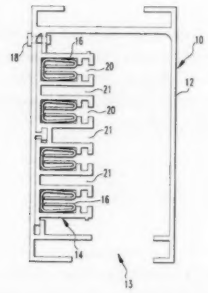
the unitary ground plane having projecting unitary lances engaging the housing and urging the unitary ground plane toward the first contacts in the first passages, whereby the unitary ground plane is urged with the unitary contacts to engage the selected ones of the first contacts in the first passages.

6,039,584

ELECTRICAL POWER DISTRIBUTION SYSTEM

Steven L. Ross, Pittsburgh, Pa., assignor to Universal Electric Corporation, Bridgeville, Pa.

Filed Nov. 9, 1998, Appl. No. 188,612
Int. Cl.[7] H01R *25/14*
U.S. Cl. 439—115 **24 Claims**



1. An electrical power distribution system comprising:

at least two track sections connected end-to-end, each said track section including an elongated metal enclosure, an elongated insulating support member secured in said enclosure and at least one electrically conducting busbar in said support member for providing electricity to a take-off device installed at any point along the length of said track;

said at least one electrically conducting busbar made of copper strip material about 0.010 to 0.125 inch thick having a generally U-shaped cross section including a base portion between a pair of spaced apart legs and an integral interior re-entrant flange on the end of each leg opposite said base, said re-entrant flanges being substantially parallel and cooperating to define a slot therebetween for receiving an electrically conductive stab on a take-off device installed in said track and provide interfacial pressure contact against said stab; and

an electrically conductive connector bar in each said busbar interconnecting it with a busbar in the adjacent track section.

6,039,585

CONNECTOR ASSEMBLY WITH SELF ACTIVATING ENVIRONMENTAL SEAL

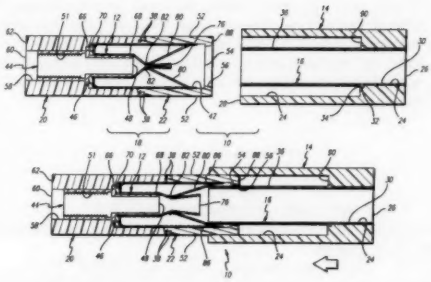
Derek Kim, Northridge, and Thomas Lopez, Los Angeles, both of Calif., assignors to Reynolds Industries Incorporated, Angeles, Calif.

Filed Mar. 10, 1997, Appl. No. 814,496
Int. Cl.[7] H01R *13/44*
U.S. Cl. 439—137 **23 Claims**

1. A connector assembly for connecting a first and a second contact, comprising:

a male housing having a rigid projection and an interior surface defining a longitudinal passageway sized to mount the first contact therein;

a female housing having an interior surface defining longitudinal passageway sized to mount the second contact therein;



a resilient sleeve having an interior surface defining longitudinal passageway between a first opening and a second opening, the resilient sleeve being elastically deformable from a resting position wherein the passageway is open and a collapsed position wherein the passageway is closed, the passageway of the sleeve in the resting position sized to accept the first contact therein, the sleeve mounted adjacent to the interior surface defining the passageway of the female housing to allow the first contact to pass into the sleeve and connect with the second contact upon the connection of the male and female housings; and

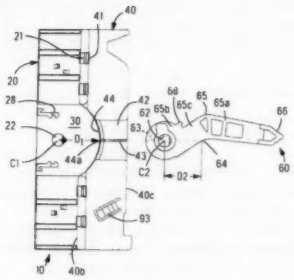
a spring mounted adjacent to the passageway of the female housing, the spring located to engage the sleeve and bias the sleeve toward the collapsed position, the spring also located to interferingly engage the rigid projection of the male housing such that upon the connection of the male and female housings the projection forces the spring to release from engagement with the sleeve, whereupon the sleeve deforms to the resting position to accept the first contact therein.

6,039,586

LEVER TYPE CONNECTOR

Hiroshi Kitamura, Kanagawa, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 4, 1997, Appl. No. 923,221
Claims priority, application Japan, Sep. 6, 1996, 8-257637
Int. Cl.[7] H01R *13/62*
U.S. Cl. 439—157 **11 Claims**



1. A lever-operated electrical connector, comprising

a housing having opposing walls;

an operating lever having parallel arms connected at outer ends thereof;

first pivot members comprising posts on outer surfaces of the opposing walls and second pivot members comprising openings extending from inner sections of the parallel arms;

biasing surfaces on the housing for biasing the inner section of the parallel arms outwardly as movement of the operating lever results in movement of the inner sections along the biasing surfaces and the opposing walls; and

co-operable rib and groove guide means comprising first guide members on the biasing surfaces and second guide members

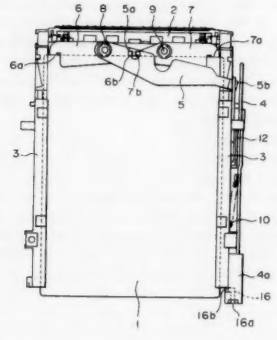
on the inner sections guiding the inner sections along the biasing surfaces an the opposing walls to align the pivot members, permitting the inner sections to move inwardly to bring the first and second pivot members into engagement, whereby the operating lever can pivotally move relative to the housing.

6,039,587

IC CARD CONNECTOR DEVICE

Wataru Oguchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 18, 1998, Appl. No. 156,990
Claims priority, application Japan, Sep. 19, 1997, 9-255393; Jan. 5, 1998, 10-000342
Int. Cl.[7] H01R *13/62*
U.S. Cl. 439—159 **16 Claims**



1. An IC card connector device comprising a frame for supporting an IC card so that it can be inserted and withdrawn, a push rod capable of reciprocating between a push position and a projecting position, and check means for locking the movement of the push rod and releasing the push rod at the push position of the push rod; wherein when the IC card is inserted, the push rod is located at the push position, said movement of the push rod at the push position being locked by said check means, the push rod is moved to the projecting position by releasing said check means and thereafter by a first push motion of the push rod, and the IC card is discharged by a second push motion of the push rod executed at this projecting position.

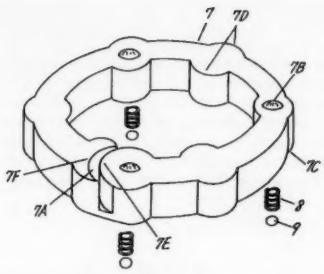
6,039,588

ROTARY CONNECTOR

Toshio Osawa, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1998, Appl. No. 114,351
Claims priority, application Japan, Jul. 11, 1997, 9-186341
Int. Cl.[7] H01R *35/04*
U.S. Cl. 439—164 **20 Claims**

1. A rotary connector comprising:
(a) a cylindrical outside case,
(b) an inside case having an inner tube, rotatably installed in said outside case,
(c) a wound flat cable installed in a space formed between said outside case and said inside case,
said wound flat cable being flexible,
a first end of said wound flat cable being connected to said outside case, and further connected to an electric circuit,
a second end of said wound flat cable being connected to said inside case, and further connected to said electric circuit, and
said wound flat cable having a U-shaped inverted portion, and



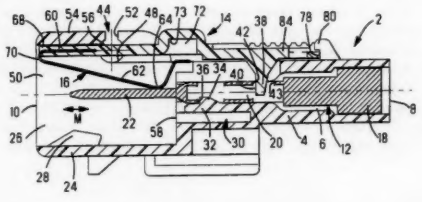
(d) a guide ring having a notch, movably installed in the space formed between the outside case and the inside case,
wherein said inverted portion of said wound cable is inverted through said notch of said guide ring,
said guide ring contacts to said inside case and said outside case,
a first frictional resistance between said guide ring and said inside case being greater than a second frictional resistance between said guide ring and said outside case, and
when said inside case is rotated, said guide ring moves by said first frictional resistance.

6,039,589

ELECTRICAL CONNECTOR WITH A SHUNT INCORPORATED INTO A SECONDARY LOCKING MEMBER

Jacques LaLange, Pontoise, and Olivier Pamart, Ecouen, both of France, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 30, 1997, Appl. No. 941,559
Int. Cl.[7] H01R *29/00*
U.S. Cl. 439—188 **10 Claims**



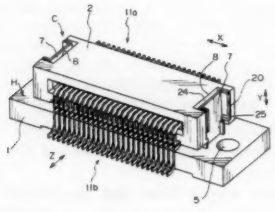
1. An electrical connector comprising a housing having terminal receiving cavities extending therethrough from a terminal receiving end to a mating end, and terminals comprising a connection section, contact section for mating with a complementary terminal of a complementary connector, and secondary locking shoulder, and primary retention means acting between the housing and the terminal to retain the terminal within the cavity, the connector further comprising a secondary locking member supported at a support to the housing and comprising a locking protrusion engageable behind the terminal secondary locking shoulder for retaining the terminal in the cavity characterized in that the connector further comprises a shunt contact for short circuit bridging two or more of the terminals of the connector, the shunt contact being attached to the secondary locking member.

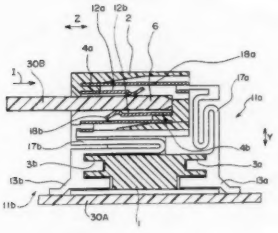
6,039,590

ELECTRICAL CONNECTOR WITH RELATIVELY MOVABLE TWO-PART HOUSING

Shinsuke Kunishi, Hadano, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Aug. 13, 1997, Appl. No. 915,550
Claims priority, application Japan, Feb. 14, 1997, 9-047208
Int. Cl.[7] H01R *13/64*
U.S. Cl. 439—247 **19 Claims**





1. An electrical connector, comprising:

a dielectric housing having a first housing part and a second housing part, the housing parts being movable relative to each other; and

at least one terminal mounted between the two housing parts and including

a termination end secured in the first housing part,

a contact end having a contact arm secured in the second housing part,

a first flexible section between said ends to allow for relative movement of the housing parts in a first given direction,

a second flexible section between the first flexible section and the contact arm to allow for relative movement of the housing parts in a second given direction generally transverse to said first given direction, the second flexible section being in juxtaposition with the contact arm, and

a stiffening section between the second flexible section and the contact arm.

6,039,591

LOCKING ELECTRICAL CONNECTOR

Richard N. Marsh, Cool, and Demian T. Martin, Oakland, both of Calif., assignors to Monster Cable Products, Inc., Brisbane, Calif.

Filed Jul. 3, 1997, Appl. No. 887,885
Int. Cl.[7] H01R *13/15*
U.S. Cl. 439—265 **26 Claims**

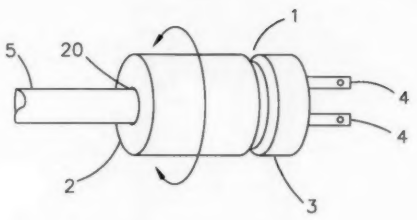
1. A multiple-connector electrical plug providing increased security of mechanical attachment and increased efficacy of electrical connection, the connector comprising:

a shell;

a plug body in operative combination with said shell;

a plurality of reversibly expandable and electrically conductive blades disposed on said plug body; and

a swage mechanism in operative combination with said shell, said plug body and at least one of said plurality of reversibly expandable and electrically conductive blades for reversibly



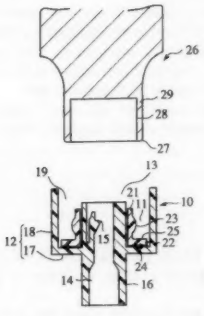
expanding said one of said plurality of reversibly expandable and electrically conductive blades.

6,039,592

METHOD OF FIXING PACKING AND STRUCTURE FOR FIXING PACKING

Akira Shinchi, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Feb. 27, 1998, Appl. No. 31,803
Claims priority, application Japan, Feb. 28, 1997, 9-046281
Int. Cl.[7] H01R *13/52*
U.S. Cl. 439—271 **8 Claims**



1. A method of fixing a packing to a member, said packing having a ring-shaped flange section, said flange including a ring-shaped groove section, said member having a contacting section capable of being brought into contact with said flange section, and said flange section and said contacting section being formed by mutually soluble resins, said method of fixing comprising the steps of:

contacting said flange section of said packing to said contacting section of said member;

inserting an ultrasonic horn into the ring-shaped groove section of said flange section; and

exciting by an ultrasonic wave from the ultrasonic horn a ring-shaped contact section between said flange section and said contacting section and fusing said flange section and said contacting section in a ring shape.

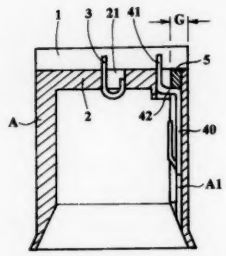
6,039,593

LAMP BASE STRUCTURE OF A SERIES OF CHRISTMAS LAMPS

Ching Chao Chen, No. 511, Sec. 3, Ton-Ta Rd., Hsin-Chu City, Taiwan

Filed Jan. 23, 1998, Appl. No. 12,222
Int. Cl.[7] H01R *13/52*
U.S. Cl. 439—280 **5 Claims**

1. A lamp base structure of a series of Christmas lamps comprising:



a groove located in an end of said base structure, said groove being defined by a groove seat having edge portions located at each end thereof and by sidewalls extending between said edge portions;

a through hole in a central portion of said groove seat and an engaging hole in one of the edge portions of said groove seat, said engaging hole being defined by a first wall portion that is located in a direction toward said groove seat central portion and by a second wall portion that is located in a direction away from said groove seat central portion;

a central conducting piece located in the through hole;

an outer conducting piece located in said engaging hole and comprising,

an upper end penetrating portion;

a lower end portion; and

a bent portion located between the upper end penetrating portion and the lower end portion so that the upper end penetrating portion is engaged by said engaging hole first wall portion and the lower end portion is parallel to and engages said second wall portion; and

an engaging block located on said outer conducting piece bent portion and adjacent to said engaging hole second wall portion.

6,039,594

BODY FOR ELECTRICAL OUTLET OR PLUG

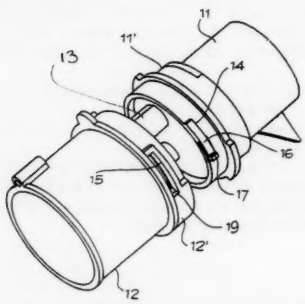
Riccardo Zuppa, Brescia, Italy, assignor to Palazzoli S.p.A., Brescia, Italy

Filed Oct. 26, 1998, Appl. No. 179,132

Claims priority, application Italy, Dec. 3, 1997, BS97U0117

Int. Cl.[7] H01R *4/54;13/62*

U.S. Cl. 439—318 **10 Claims**



1. An electrical outlet or plug for industrial and/or tertiary use, the electrical outlet or plug comprising:

a body enclosing a connecting jack, said body including a grip element and a jack-holding element, which are joined in an axial direction by means of a bayonet connection and by positioning at least one spring-like stopping means between said grip element and said jack-holding element, one of said grip element and said jack-holding element of said body having radial fins and the other of said grip element and said jack-holding element of said body having radial fin seats for accommodating and holding said radial fins and following a corresponding rotation of one element in relation to the other, said spring-like stopping means including a spring-like tongue which forms a single piece with one of said grip element of said body and said jack-holding element of said body and engages, by spring action, with a support shoulder on the other of said grip element of said body and said jack-holding element of said body.

6,039,595

ELECTRICAL CONNECTOR

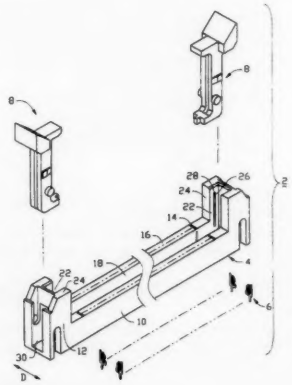
Gwou-Jong Tseng, and Yuh-Huey Kang, both of Tu-Chen, Taiwan, assignors to Hon Hai Precison Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Aug. 3, 1999, Appl. No. 366,160

Claims priority, application Taiwan, Apr. 27, 1999, 88206557

Int. Cl.[7] H01R *13/64*

U.S. Cl. 439—377 **3 Claims**



1. An electrical connector adapted for connecting a memory module to a circuit board, comprising:

an elongate housing including:

an elongate body including a plurality of cavities formed in opposite side walls thereof and an elongate slot defined between the two side walls in communication with the cavities for insertion of the memory module, the slot being slightly wider than the memory module; and

a pair of arms extending from opposite ends of the body, each arm defining a channel in an inner surface thereof in communication with the slot of the body for guiding the memory module into the slot, a pair of elongate ribs projecting from opposite inner surfaces of opposite side walls of each arm for abutting against the memory module thereby restricting movement of the memory module along a lateral direction;

a plurality of contacts received in the cavities of the housing and exposed to the slot for mating with the memory module; and

an ejector secured to the housing for ejecting the memory module from the slot of the housing;

wherein each rib projects from a lower portion of the inner surface of the side wall of the arm proximate the slot of the body to an upper portion of the arm;

wherein a chamfer is formed in a top portion of each rib for guiding the memory module to abut against the rib;

wherein the surface of each rib is arcuate for making a line contact with the memory module thereby reducing a frictional force between the ribs and the memory module.

6,039,596

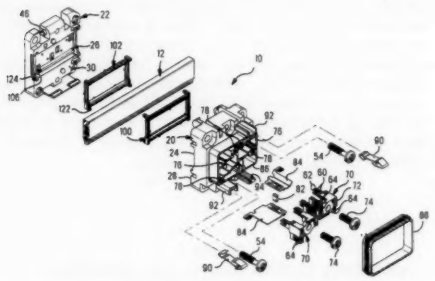
GASKETS FOR POWER CABLE TAP CONNECTOR

Robert Neil Whiteman, Jr., Middletown; Earl William McCleerey, Mechanicsburg, and Jeffrey Byron McClinton, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Provisional application No. 60/064,998, Nov. 10, 1997. This application Oct. 13, 1998, Appl. No. 170,348.

Int. Cl.[7] H01R *4/20*

U.S. Cl. 439—404 **13 Claims**



1. An assembly for sealing around a termination site of an electrical cable within an electrical connector, comprising:

upper and lower housings having respective cable faces defining therebetween a cable-receiving channel through which extends the cable;

upper and lower gaskets each having side sections coextending along respective sides of said cable-receiving channel and each having end sections coextending between said side sections and traversing said cable-receiving channel proximate ends of said cable-receiving channel, said side and end sections defining a continuous loop around an enclosed region on respective upper and lower surfaces of said cable;

each of said upper and lower gaskets including cable-facing surfaces of said side and end sections protruding into said cable-receiving channel to be engaged and compressed by said cable upon said upper and lower housings being fastened about a length of said cable, sealing within said enclosed region an area along upper and lower surfaces of said cable for penetration of insulation of said cable by contacts of at least one of said upper and lower housings to electrically connect said contacts to conductors of said cable.

6,039,597

LAMPHOLDER FOR COMPACT FLUORESCENT LAMPS

Arkady Getselis, Staten Island; Walter Newman, Bayside, and Anthony Tufano, North Massapequa, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Division of application No. 08/687,864, Jul. 26, 1996, Pat. No. 5,758,952. This application Jun. 1, 1998, Appl. No. 88,476.

Int. Cl.[7] H01R *4/24*

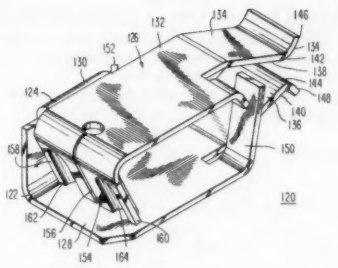
U.S. Cl. 439—441 **8 Claims**

1. An electrical contact comprising:

a) a contact body having a first end and a second end;

b) said contact body made up of a top wall and a bottom wall partially joined to one another by a partial side wall and arranged to form a box with an open side wall;

c) said top wall at said first end having a first inwardly directed segment in a direction towards said bottom wall, followed by a first outwardly directed segments in a direction away from said bottom wall and a first curved segment between said first inwardly and first outwardly directed segments;



d) said bottom wall at said first end having a second inwardly directed element in a direction towards said top wall, followed by a second outwardly directed segment in a direction away from said top wall and a second curved segment between said second inwardly and second outwardly directed segments, said first and second curved segments separated by a distance to permit the entry and retention of an electrical contact therebetween; and

e) a first cantilevered member extending from said bottom wall at said second end of said contact body, said cantilevered member bent inwardly towards an inside surface of said bottom wall and having a free end spaced apart from an inside surface of said top wall to engage the bared end of a conductor inserted between said free end and said inside surface of said top wall, said cantilevered member acting a an independent one-way clutch to prevent the removal of an inserted conductor.

6,039,598

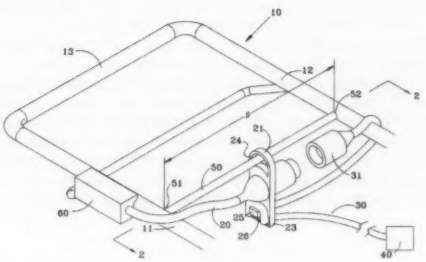
ELECTRIC EQUIPMENT INTERCONNECTION

Nicholas Ciavarella, Cleveland, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Jan. 26, 1998, Appl. No. 13,155

Int. Cl.[7] H01R *13/58*

U.S. Cl. 439—451 **20 Claims**



1. An electric apparatus comprising:

a deck;

first (**11**) and second (**12**) handle bars extending from said deck;

a rod (**50**) operatively connected to said first and second handle bars;

a power receiver adapted to receive power through an associated extension cord plugged into an external source of power; and,

a connection member fixedly connected to said power receiver for use in connecting said power receiver to the associated extension cord, said connection member comprising:

a body;

a first opening in said body for slidingly receiving said rod, said connection member thereby being slidable along said rod;

a second opening in said body adapted to selectively receive a loop of the associated extension cord; and, a tab over which the loop of the associated extension cord may be looped, said tab protruding from said body.

6,039,599

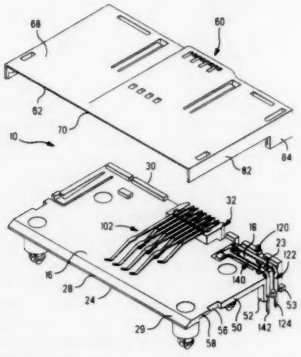
SWITCH FOR A CARD READER ASSEMBLY

Karen Elizabeth Benjamin, Harrisburg, and James Henry Hyland, Hummelstown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Provisional application No. 60/051,322, Jun. 30, 1997. This application Jun. 29, 1998, Appl. No. 106,437.

Int. Cl.[7] H01R *3/00*

U.S. Cl. 439—489 **8 Claims**



1. A switch for a card reader assembly including a housing having a card receiving cavity, said switch being disposed in said cavity, said switch including first and second terminals, said terminals being in one position when a card is in said cavity and in an other position when said card is not in said cavity, said switch comprising:

said first terminal including a board mounting section at an end thereof, a body portion having a retention section and a contact section spaced from the board mounting section;

said second terminal including a board mounting section at one end, an intermediate portion having a retention section and a switch portion at an opposed second end, said switch portion having a card engaging end and a contact engaging end spaced therefrom and a fulcrum engaging portion therebetween, said contact engaging end being in said one position relative to said contact section of said first terminal;

said housing defines a fulcrum adapted to support said fulcrum engaging portion of said second terminal;

whereby, upon inserting a card into said card receiving cavity, said card engages said card engaging end of said second terminal causing said fulcrum engaging portion of said second terminal to pivot about said fulcrum thereby moving said switch portion to said other position relative to said contact section of said first terminal, providing an electrical signal indicating that said card is fully inserted into said cavity.

6,039,600

MALE CONNECTOR FOR FLAT FLEXIBLE CIRCUIT

Harry N. Etters, Plainfield; Robert M. Fuerst, Maple Park, and Russell J. Watt, Chicago, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

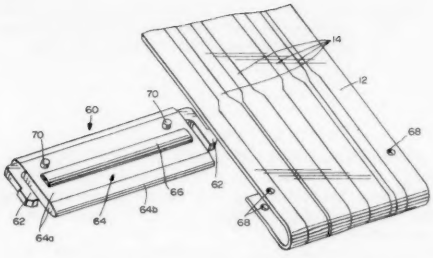
Filed Oct. 10, 1997, Appl. No. 948,759

Int. Cl.[7] H01R *9/07*

U.S. Cl. 439—496 **12 Claims**

1. A male connector for electrically interconnecting conductors of a flat flexible circuit to conductors of a complementary mating connecting device without the use of conductive terminals, comprising:

a relatively rigid male body member on which the flexible circuit is positioned with the conductors of the circuit facing away from the body member, the body member including positioning means formed integrally thereon for locating the flexible circuit relative to the body member, the positioning means comprising bosses integrally formed on the body member and adapted to be received in corresponding holes formed in the flexible circuit, and further including at least one latching member integrally formed on the body member and adapted to latchingly engage within a corresponding latch-receiving opening in the mating connecting device and



a relatively yieldable backing structure of generally uniform thickness attached to the body member for resiliently biasing the conductors of the flexible circuit against the conductors of the mating connecting device when the connector is mated with the device, wherein the backing structure is formed of a different material than the body member.

6,039,601

CONTACT SPRING HAVING AN IMPROVED ELECTRICAL CONTACT

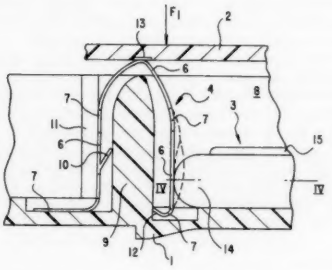
Josef Kraiczyk, Regensburg, and Stephanus Mulders, Hagelstadt, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 6, 1998, Appl. No. 36,651

Claims priority, application Germany, Mar. 6, 1997, 197 09 188

Int. Cl.[7] H01R *3/00*

U.S. Cl. 439—500 **7 Claims**



1. A portable electronic device, comprising:

a housing;

first and second electrical components disposed in said housing; and

a contact spring electrically connecting said first and second electrical components to one another;

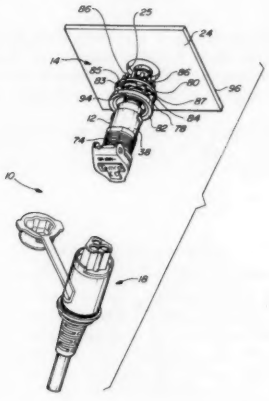
said contact spring having a plurality of mutually parallel, cutout slits formed therein and a plurality of spring arms defined between said slits, said contact spring being preshaped such that when said first and second electrical components are inserted in said housing, said contact spring is subjected to mechanical pressure by said first electrical component, said contact spring transferring at least a portion of the mechanical pressure to said second electrical component and causing at least two of said spring arms to rest with mechanical prestressing on said first electrical component, and at least two others of said spring arms to rest with mechanical prestressing on said second component.

6,039,602

BUMPER MOUNTED CORD SET

Ireneusz Witkowski, and Claudio Zubin, both of Winnipeg, Canada, assignors to Phillips & Temro Industries Ltd., Canada

Filed Jun. 5, 1998, Appl. No. 92,527
Int. Cl.[7] H01R *13/73*
U.S. Cl. 439—550 **19 Claims**



1. A cord set housing adapted to couple a cord set to a structure, said cord set including a first cord having a first end connectable to a power source and a second end connected to a plug, a second cord having a first end connectable to the electrical device and a second end connectable to the plug, said cord set housing comprising:

a body defining an axis, an outer surface, and a cavity; and

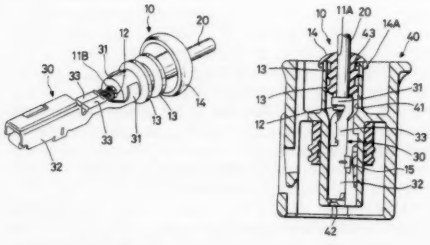
a first coupler for coupling said cord set housing to the structure, said first coupler including axially spaced ribs extending from the outer surface of said body, said axially spaced ribs having a pitch angle of zero relative to said body axis.

6,039,603

RUBBER PLUG FOR WATERPROOF CONNECTOR

Shigekazu Wakata, and Eiji Saijo, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Continuation of application No. 08/249,931, May 26, 1994. This application Jan. 28, 1998, Appl. No. 14,617.
Claims priority, application Japan, Jun. 14, 1993, 5-168437
Int. Cl.[7] H01R *13/40*
U.S. Cl. 439—587 **7 Claims**



1. A rubber plug for use in a waterproof connector, the rubber plug comprising:

a hole and a wire passed through the hole, the rubber plug and the wire being insertable into an open end of a tubular portion of the waterproof connector to form a seal between a wall of the tubular portion and the wire; and

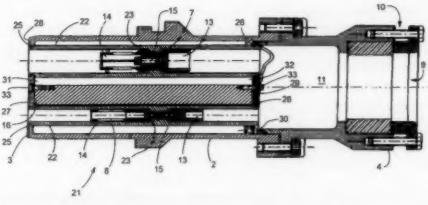
an end plug positioned at a side of the waterproof connector at which the open end is disposed, the end plug closing the open end and having a convex shaped outer surface so as to cover the open end and direct water away from the wire and the hole.

6,039,604

CABLE COUPLING ASSEMBLY

Glenn Andrew Tindall, North Parramatta, Australia, assignor to Metal Manufactures Limited, New South Wales, Australia

Continuation-in-part of application No. 08/772,843, Dec. 24, 1996, abandoned. This application Jan. 14, 1998, Appl. No. 6,949.
Claims priority, application Australia, Sep. 30, 1996, PO2684
Int. Cl.[7] H01R *13/40*
U.S. Cl. 439—598 **19 Claims**



1. An electrical cable coupling assembly including:

a body having a first end configured for receiving a complementary coupling assembly and a second end configured for receiving an electrical cable having a plurality of cores;

a plurality of conductive connectors each adapted to receive a a corresponding one of the cores at one end and a corresponding conductive connector member associated with the complementary coupling assembly at the other end to allow electrical connection between the corresponding core and the corresponding connector member, and releasable electrical connection between the corresponding core and a corresponding core in the complementary coupling assembly;

a plurality of substantially tubular insulators each captively retained at least partially in the body and at least partially enveloping a corresponding one of the connectors;

a first plate disposed at the first end of the body and coupled to the body and having a plurality of apertures each of which is in axial alignment with one of the insulators; and

a second plate spaced from the first plate and disposed between the first and second ends of the body and coupled to the body and to the first plate and having a plurality of apertures each of which is in axial alignment with one of the insulators, each of the insulators being clamped at least partially between the first and second plates.

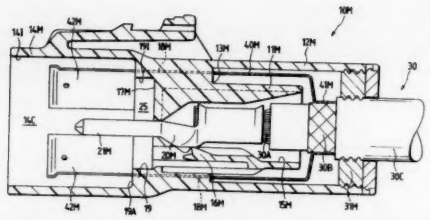
6,039,605

SHIELD CONNECTOR WITH ENHANCED INSULATION OF A SHIELD SHELL

Tsutomu Tanaka, Nagoya, Japan, assignor to Harness Systems Technologies Research, Ltd., Nagoya; Sumitomo Wiring Systems, Ltd., Mie, and Sumitomo Electric Industries, Ltd., Osaka, all of Japan

Filed Jul. 6, 1998, Appl. No. 110,267
Claims priority, application Japan, Jul. 22, 1997, 9-196130
Int. Cl.[7] H01R *9/03*
U.S. Cl. 439—610 **5 Claims**

1. A shield connector extending along an axis and having a female connector housing and a male connector housing that to releasably connect together, the male connector housing including a male-side fitting surface and a male metal terminal with a distal end portion projecting from the male-side fitting surface mounted in the male connector housing, the female connector housing



including a female-side fitting surface, each of the male and female connector housings including a shield shell extending in an axial direction, the male-side fitting surface and the female-side fitting surface extending radial relative to the axis and forming a gap therebetween when the male and female connector housings are releasably connected together, the shield connector comprising:

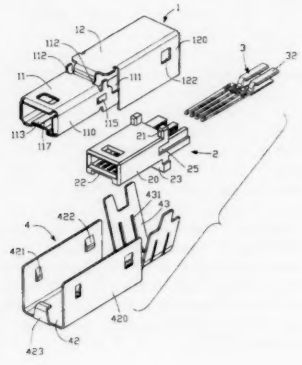
a step portion formed on one of the male connector housing and the female connector housing and exposed to the distal end portion of the male metal terminal through the gap, a respective one of the shield shells extending through the step portion.

6,039,606

CABLE CONNECTOR

Song-Rong Chiou, Lin-Kou, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsian, Taiwan

Filed Jun. 28, 1999, Appl. No. 342,659
Claims priority, application Taiwan, Sep. 25, 1998, 87215984
Int. Cl.[7] H01R *13/648*
U.S. Cl. 439—610 **7 Claims**



1. A cable connector comprising:

a first shield having a base and a first shell connected with a top surface of the base, the top surface of the base having an opening in opposite sides proximate the first shell, side walls of the base each forming a tongue proximate the first shell, a bottom surface of the base having two end edges coupled together to form an inwardly longitudinal protrusion along a central portion thereof, an insertion piece extending from a distal end of the longitudinal protrusion proximate the first shell;

a dielectric housing substantially received in the base, the dielectric housing having a pair of posts projecting from a top surface thereof for insertion into the openings of the base and a board projecting from a bottom surface thereof, the bottom surface having a longitudinal recess for snappingly receiving the longitudinal protrusion, side walls of the dielectric housing each forming a notch for receiving the tongue of the base, the board defining a slot in communication with the longitudinal recess for receiving the insertion piece; and

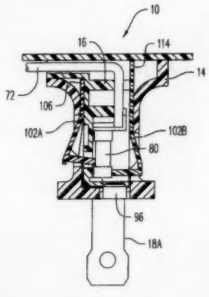
a second shield having a second shell engaged with the first shell and a cover extending from the second shell for enclosing a cable, the second shell forming a latch opposite the cover for mating with the slot of the dielectric housing; wherein said first and second shells are U-shaped.

6,039,607

ELECTRIC PLUG

Tat Kwong Cheung, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Top Power Supply Cord Set Co, Limited, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Dec. 15, 1998, Appl. No. 210,838
Int. Cl.[7] H01R *13/68*
U.S. Cl. 439—622 **10 Claims**



1. An electric plug comprising a body member to which switching means and at least first and second electrically conductive leg members are mounted, wherein an electric cable comprising at least first and second electric wires is connectable to said body member, wherein said leg members are electrically connectable to a source of electricity, wherein said first leg member is electrically connectable in series with said first electric wire via a fuse member releaseabley attachable to and movable with said switching means, and wherein said switching means is operable to move siad fuse member between a first position in which said fuse member is in electrical connection with said first leg member, and a second position is which said fuse member is out of electrical connectin with said first leg member, wherein said body member comprises a housing member and a core member which is slidably received therein, wherein said fuse member, said switching means and said leg members are carried by said core member, and wherein said housing member comprises a plurality of wall members joined with a bottom member, wherein said bottom member comprises at least two apertures each for receiving therethrough one of said leg members.

6,039,608

ADAPTER SYSTEM

Willard F. Amero, Jr., Flowery Branch, and John E. Herrmann, Lawrenceville, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

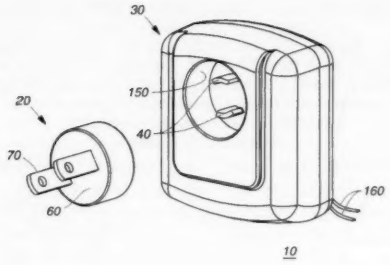
Filed Feb. 27, 1998, Appl. No. 31,605
Int. Cl.[7] H01R *25/00*
U.S. Cl. 439—651 **3 Claims**

1. An adapter system comprising

a. an adapter with plug prongs on its front face and apertures on its back face, and adapter contacts within it; and

b. a power supply with power supply prongs disposed outwardly, which prongs have undercuts at their distal ends;

where the power supply contacts can be inserted into the apertures of the adapter, and the adapter is then rotated along the axis of insertion, mechanically securing the adapter to the



power supply and simultaneously making electrical contact between the adapter and the power supply.

6,039,609

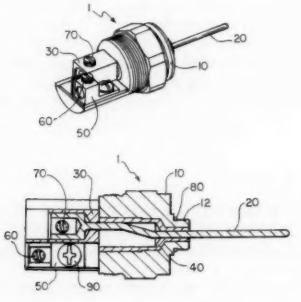
POWER INSERTER CONNECTOR

Bruce C. Hauver, Sr.; Ronald P. Locati, both of Elmira, N.Y., and Larry Michael Massaglia, Crestline, Calif., assignors to Thomas & Betts International, Inc., Sparks, Nev.

Provisional application No. 60/021,926, Jul. 17, 1996. This application Jan. 13, 1997, Appl. No. 783,398.

Int. Cl.[7] **H01R** *17/18*

U.S. Cl. 439—668 **28 Claims**



1. A power inserter connector comprising:

an electrically conductive body open on each of a first end and a second end, said body having a central bore disposed therethrough, said first body end having a mounting surface;

an electrically conductive terminal having a first end and an elongated second end, said first terminal end including a first seizure mechanism comprising a central bore having a diameter greater than or equal to an AWG #14 conductor and a threaded bore for receiving a first seizure screw, said first seizure screw for securing a first power conductor sized between AWG #14 and AWG #2 and placed within said central bore of said first seizure mechanism;

an insulator for isolating said terminal from said body, said insulator mounted on said mounting surface of said first body end and configured to receive and secure said first terminal end, said insulator having a bore through which said elongated second terminal end extends; and

a second seizure mechanism disposed within and in electrical contact with said first body end, said second seizure mechanism comprising a central bore having a diameter greater than or equal to an AWG #14 conductor and a threaded bore for receiving a second seizure screw, said second seizure screw for securing a second power conductor sized between AWG #14 and AWG #2 and placed within said central bore of said second seizure mechanism.

6,039,610

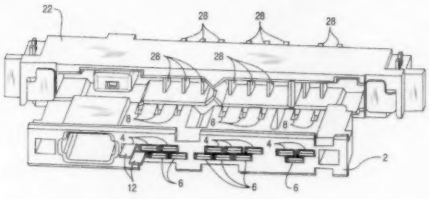
MULTIPLE CIRCUIT FORK CONTACT CONNECTOR

William Vito Pauza, Palmyra, and Harold William Kerlin, Elizabethville, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Provisional application No. 60/081,105, Apr. 8, 1998. This application Jun. 12, 1998, Appl. No. 97,280.

Int. Cl.[7] **H01R** *13/10*

U.S. Cl. 439—682 **15 Claims**



10. An electrical connector comprising:

(a) a first housing comprising an insulating material and having first and second arrays of linearly aligned rectangular channels extending inwardly through a front part of the first housing; the first array being parallel to and spaced apart from the second array; the channels of the first array being linearly offset from and partially overlapping the channels of the second array; each of said channels of the first array of channels extending inwardly through to a channel of a third array of rectangular channels at a rear part of the first housing, each channel of said third array being perpendicular to the corresponding channel of said first array, and each of said channels of the second array of channels extending inwardly through to a channel of a fourth array of rectangular channels at a rear part of the first housing, each channel of said fourth array being perpendicular to the corresponding channel of said second array;

(b) a forked metallic contact mounted in each of the channels of the first and second array of channels; each forked metallic contact comprising a planar base having two longitudinal ends; a pair of parallel, coplanar prongs at one of the ends separated by a gap; each forked metallic base mounted in a channel of the first array of channels with the prongs positioned in one of the channels of the third array of channels and each forked metallic base mounted in a channel of the second array of channels with the prongs positioned in one of the channels of the fourth array of channels, wherein the base of each contact is coplanar with the longest of the length or width dimension of its channel face; and

(c) a second housing, at least one array of linearly aligned electrical contact blades extending out of said second housing, each blade being positioned between the prongs of one of the forked electrical contacts within a channel of the third or fourth array of channels.

6,039,611

CONNECTOR

George Yang, Shih-Lin District, Taiwan, assignor to All Best Electronics Co., Ltd., Taipei, Taiwan

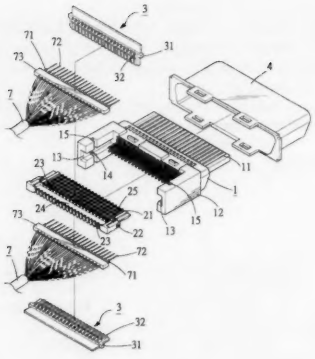
Filed Jun. 16, 1999, Appl. No. 334,716

Int. Cl.[7] **H01R** *13/502*

U.S. Cl. 439—701 **1 Claim**

1. An electrical connector comprising a plastic body, a steel case housing a front part of said plastic body, an insertion body assembled to a rear end of said plastic body, two covers, and two interconnecting cables symmetrically connected to upper and lower sides of said insertion body at a rear portion thereof;

said plastic body being provided at a front surface with upper and lower rows of alternately arranged insertion terminals and at two lateral sides with two rearward extended side walls that are formed at respective inner surface with a guiding rail



having a retaining hole provided at a predetermined suitable position, and two vertically extended insertion slots being symmetrically provided at inner surfaces of said two side walls at the respective predetermined positions;

said insertion body being provided at top and bottom front surfaces with two rows of terminal slots corresponding to said insertion terminals on said plastic body and at two lateral sides of said insertion body with protrusions corresponding to said retaining holes in said guiding rails of said plastic body; said insertion body also being provided between adjacent rear ends of said terminal slots with partitioning ribs, two transverse receiving recesses being separately provided on upper and lower surfaces of said insertion body to divide said partitioning ribs into discontinued front and rear sections;

each of said interconnecting cables including a plurality of conductors that are arranged corresponding to said insertion terminals and fixed in place by clamping said conductors between two transversely extended clamping pieces, such that bared front ends of said conductors forward project from a front side of said clamping pieces, and said clamping pieces being suitable for positioned in said receiving recesses of said insertion body with said bared front ends of said conductors located in corresponding terminal slots on rear ends of said insertion terminals in the same said terminal slots; and

said two covers being symmetrically formed and having at each lateral end a centered projection corresponding to said vertical insertion slot in said plastic body and each of said covers having a front edge including a plurality of forward projected pressing ribs corresponding to said terminal slots on said insertion body;

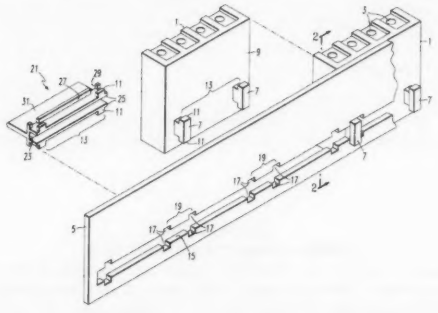
said insertion body being inserted into said plastic body with rear ends of said insertion terminals located in said terminal slots between front sections of two adjacent partitioning ribs, said clamping pieces with conductors clamped therebetween being set in said receiving recesses on said insertion body with said conductors separately located between two adjacent partitioning ribs and said bared front ends of said conductors located on and contacting with rear ends of said insertion terminals correspondingly located in said terminal slots, said two covers being located onto said clamping pieces with said lateral projections aligning with said vertical insertion slots on said plastic body and being received said recesses of said insertion body and said pressing ribs forward projected from said covers located in said terminal slots above said bared fronts of said conductors and said insertion terminals to tightly press said conductors together, and rear edges of said covers being firmly connected to rear sections of said partitioning ribs and said pressing ribs to said front sections of said partitioning ribs at two sides of said terminal slots by means of radio heating; whereby each bared front end of said conductors is located in one said terminal slot to tightly contact with only one said insertion terminal to free said connector from short circuits at contact points.

6,039,612

ARRANGEMENT FOR MOUNTING TERMINAL BLOCKS IN A MOUNTING PANEL

Jack L. Brown, Hendersonville; Rodney William Bruner, Fletcher; Neal Edward Rowe, Asheville; William Edward Wilkie, II, Fletcher, and Robert Yanniello, Asheville, all of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 3, 1999, Appl. No. 261,796
Int. Cl.[7] H01R *9/26*
U.S. Cl. 439—716 **14 Claims**



1. Apparatus comprising:

at least one molded block supporting electrical terminal members, said at least one molded block having at least of pair of spaced, oppositely directed hooks extending rearwardly therefrom; and

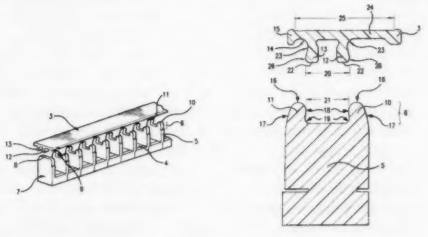
a mounting panel having therein an elongated mounting slot, said elongated mounting slot having at least a pair of lateral extensions forming notches spaced and sized for passage of said hooks therethrough for engaging said mounting panel with said at least one molded block displaced in said slot so that said hooks are out of registration with said notches.

6,039,613

BARRIER STRIP COVER AND BARRIER STRIP FOR POWER DISTRIBUTION PANELS

Peter Bullard, Schwenksville, Pa., assignor to Ron Francis, Aston, Pa.

Provisional application No. 60/065,412, Nov. 13, 1997. This application Nov. 13, 1998, Appl. No. 191,644.
Int. Cl.[7] H01R *9/22*
U.S. Cl. 439—718 **14 Claims**



1. An electrical barrier strip having connectors for making contact with wires comprising:

a. a base;

b. electrical connectors secured to the base;

c. partitions extending upwards from the base above each connector and between each connector and at the ends of the base;

d. a cover;

e. a forward extension and a rearward extension, both located on the bottom of the cover for engaging the partitions between

each connector, the forward cover extension and the rearward cover extension having an inner edge and an outer edge;

f. a forward extension and a rearward extension, both located on the top of each partition between each connector for engaging the bottom of the cover, the forward partition extensions having a shape complementary to the forward cover extension and the rearward partition extension having a shape complementary to the rearward cover extension, wherein the distance separating the extensions on the partitions is slightly less than the distance of the outer edges of the extensions on the bottom of the cover so that the cover extensions and partition extensions releaseably engage each other when the cover is placed upon the barrier strip;

g. means located on the cover for engaging the partition at at least one end of the base; and

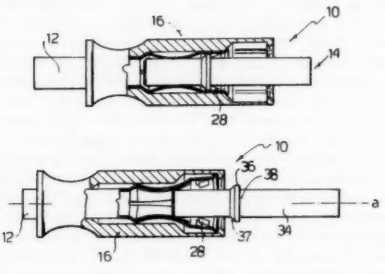
h. means located on the partitions at the end of the base for engaging the cover.

6,039,614

FAST COUPLING AUTOMATIC LATCHING CONNECTOR RELEASABLE BY MOVEMENT OF AN EXTERNAL BODY

Luigi Ramari, Via A. Casati, 135-20043 Arcore, Italy

Filed Aug. 5, 1997, Appl. No. 905,925
Int. Cl.[7] H01R *13/00*
U.S. Cl. 439—843 **11 Claims**



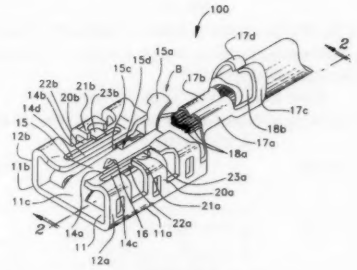
1. A fast coupling connector assembly for connection of electric cables of a type comprising a male element and a female element engageable one with the other and a body element or sleeve which houses both the male element and the female element in an engaged position, the body element being slidable for a length on the female element between a locking position, wherein it locks the male element and female element in the engaged position, and a release position wherein it allows release of the male element and female element, retaining means being provided to restrain the male element and the female element in the position wherein they are engaged one with the other, wherein said female element comprises a retaining part with elastic fingers which, in a non-deformed condition, not forced, are spread apart, at least one of said fingers having a retaining tooth towards an interior of the female element, said retaining tooth/teeth forming said retaining means, said male element comprises a shoulder surface for co-operating, in the engaged position, with said retaining means of the female element, said body element is configured with an internal housing which comprises at least a first chamber, shaped with dimensions such as to house the retaining part of the female element in a contracted condition with the fingers close one to the other.

6,039,615

FEMALE ELECTRICAL TERMINAL HAVING OVERSTRESS MEMBERS

Mitsuru Suzuki, Kanagawa, Japan, assignor to The Whitaker Corporation, Wimington, Del.

PCT No. PCT/US97/04002, § 371 Date Aug. 26, 1998, § 102(e) Date Aug. 26, 1998, PCT Pub. No. WO97/34341, PCT Pub. Date Sep. 18, 1997
PCT Filed Mar. 13, 1997, Appl. No. 125,951
Claims priority, application Japan, Mar. 15, 1996, 8-059068
Int. Cl.[7] H01R *11/22*
U.S. Cl. 439—849 **6 Claims**



1. A female electrical terminal for electrical connection to a mating tab terminal, comprising

a base plate having side plates extending upwardly from the base plate;

upper contact parts located at ends of the side plates extending over the base plate and substantially parallel to the base plate;

a lower contact part extending rearwardly from a forward part of the base plate and having a projection thereon for engaging a hole in the mating tab terminal; and

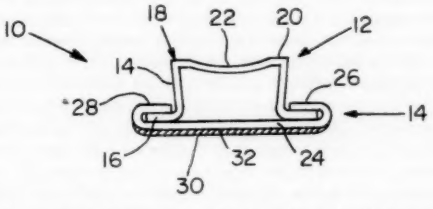
arm parts extending upwardly from the base plate with free ends of the arm parts being disposed above the upper contact parts to provide overstress protection to the upper contact parts.

6,039,616

CIRCULAR ELECTRICAL CONNECTOR

John Pereira, Rehoboth, Mass.; Manuel Machado, Hope, and Stephen Antaya, West Kingston, both of R.I., assignors to Antaya Technologies Corporation, Cranston, R.I.

Filed Nov. 25, 1998, Appl. No. 199,810
Int. Cl.[7] H01R *4/10*
U.S. Cl. 439—874 **13 Claims**



1. An electrical connector useful for making electrical contact with a coated glass surface, comprising:

an electrically conductive post member having first and second ends, said post member including a cylindrical portion having a top at said first end and a foot portion at said second end; and

an electrically conductive base member mounted to said foot portion, said base member having a top surface and a bottom surface facing away from said post member, said bottom surface including at least one standoff extending from said bottom surface, said foot portion being mounted directly on said top surface;

whereby when said base member bottom surface is rested against a contact surface to which said electrical connector is to be soldered, said at least one standoff raises said bottom surface to defines a minimum volume between said bottom surface and said contact surface which, when filled with solder, is sufficient to hold said electrical connector to said contact surface.

6,039,617

TILT CYLINDER DEVICE FOR OUTBOARD MOTOR

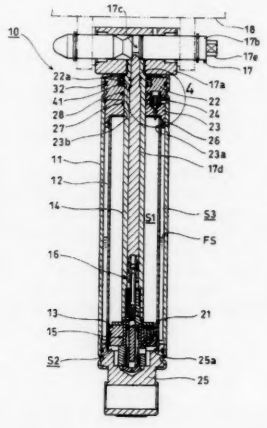
Tamotsu Nakamura, Saitama, Japan, assignor to Showa Corporation, Saitama, Japan

Filed Nov. 9, 1998, Appl. No. 188,924

Claims priority, application Japan, Mar. 24, 1998, 10-076285

Int. Cl.[7] B63H *21/26*

U.S. Cl. 440—61 **2 Claims**



2. A tilt cylinder device for an outboard motor attachable to a boat stern, at selectable arbitrary positions when the motor is swung from its in-use position to its stand-by position, said tilt cylinder device being interposed between the stern and said motor to moderate a shock sustained by the motor during running, the device comprising a piston, a hollow piston rod extending in one direction from the piston, a cylinder for movably holding the piston rod, a hollow piston rod-side oil chamber and an opposite-side oil chamber which is opposite from said hollow piston rod-side oil chamber and which defined in said cylinder by said piston, an accumulator chamber provided outside of said cylinder for also serving as a volume compensating chamber for compensating the volume of oil which flows in and out of said opposite-side oil chamber as said hollow piston rod is advanced or withdrawn, said piston being formed with communication passage means for bringing said two oil chambers into communication with each other, said communication passage means being provided with a relief valve which opens when pressure in said hollow piston rod-side oil chamber exceeds a set pressure, said hollow piston rod being provided therein with a delay mechanism for delaying a closing operation of said relief valve by pushing the body of said relief valve in its valve opening direction for a predetermined time period after said relief valve is opened, and said tilt cylinder device including an exterior operating rod capable of forcibly opening and closing said relief valve through said delay mechanism.

6,039,618

EXHAUST ARRANGEMENT FOR OUTBOARD MOTOR

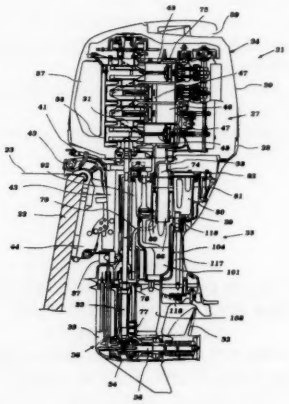
Noriyoshi Hiraoka, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 22, 1998, Appl. No. 120,614

Claims priority, application Japan, Jul. 22, 1997, 9-210154; Aug. 29, 1997, 9-247556

Int. Cl.[7] B63H *1/00*

U.S. Cl. 440—89 **26 Claims**



1. An outboard motor comprised of a power head and a drive shaft housing and lower unit depending from said power head, said power head containing a powering, four cycle, internal combustion engine and a surrounding protective cowling, a propulsion device contained within said lower unit for propelling an associated watercraft through a body of water in which it is operating, a transmission system for transmitting drive from said engine to said propulsion device, an expansion chamber formed in said drive shaft housing, an exhaust pipe depending from said engine into said expansion chamber for delivering of exhaust gases to said expansion chamber, an oil tank for said engine disposed in said drive shaft housing at the upper area of said expansion chamber and in proximity to said exhaust pipe, said expansion chamber communicating with the atmosphere through a below the water high speed exhaust gas discharge, an above the water low speed exhaust gas discharge formed above the normal water level, and means for communicating exhaust gasses from said engine to said above the water low speed exhaust gas discharge through a path that extends vertically above the level of oil in said oil tank.

6,039,619

METHOD AND APPARATUS FOR MANUFACTURING PARTITION WALL OF PLASMA DISPLAY DEVICE

Young-Cheol Kang, Suwon; Byung-Hak Lee, Ansan, and Man-Ho Song, Seoul, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 22, 1998, Appl. No. 83,048

Claims priority, application Rep. of Korea, May 22, 1997, 97-11978; May 22, 1997, 97-19976; May 22, 1997, 97-19977; Jul. 15, 1997, 97-32827

Int. Cl.[7] H01J *9/00*

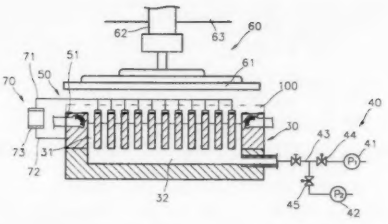
U.S. Cl. 445—24 **22 Claims**

1. A method for manufacturing a partition wall of a plasma display device comprising:

(a) providing a substrate and a block in which partition wall forming grooves having the same pattern as that of partition walls are formed;

(b) providing a substrate including a coating layer for easily separating the block from the substrate;

(c) positioning the substrate on the block;



(d) pressing the substrate against the block such that part of the substrate is inserted into the partition wall forming grooves to form partition walls; and

(e) separating the substrate from the block.

6,039,620

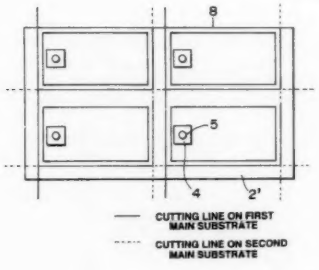
METHOD OF MANUFACTURING VACUUM HERMETIC VESSELS

Shigeo Itoh; Yoshio Makita; Takeshi Tonegawa; Yoshihiko Hirata, and Akira Kadowaki, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jul. 2, 1997, Appl. No. 887,083

Int. Cl.[7] H01J *9/26*

U.S. Cl. 445—25 **3 Claims**



1. A method of manufacturing a vacuum vessel comprising the steps of:

forming plural exhaust holes in a first main substrate at predetermined positions thereon, said first main substrate from which plural first substrates can be obtained;

superposing a second main substrate over said first main substrate with said plural exhaust holes formed therein, said second substrate from which plural substrates are obtained, and placing plural getter boxes on said first main substrate so as to cover said exhaust tubes formed therein;

hermetically sealing said first main substrate and said second main substrate superposed and, at the same time, hermetically sealing said getter boxes and said first main substrate placed together;

evacuating spaces between said first substrates and said second substrates using said plural getter boxes sealed with said first main substrate, and then sealing said plural getter boxes; and

cutting said first main substrate and said second main substrate evacuated and hermetically sealed, at predetermined positions, while lead-out electrodes formed on each of said first substrates and lead-out electrodes formed on each of said second substrates are not covered by another substrates, whereby plural hermetic vessels each formed of a first substrate and a second substrate evacuated and sealed together are obtained at the same time.

6,039,621

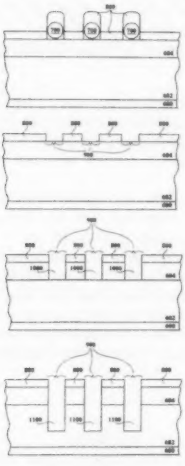
GATE ELECTRODE FORMATION METHOD

Kishore K. Chakravorty, and Philip J. Elizondo, both of San Jose, Calif., assignors to Candescent Technologies Corporation, San Jose, Calif.

Filed Jul. 7, 1997, Appl. No. 889,622

Int. Cl.[7] H01J *9/02*

U.S. Cl. 445—49 **33 Claims**



1. A method for forming a gate electrode, said method comprising the steps of:

a) depositing a gate metal over an underlying substrate such that a layer of said gate metal is formed above said underlying substrate, said layer of said gate metal deposited to a thickness approximately the same as a desired thickness of said gate electrode;

b) depositing polymer particles onto said layer of gate metal;

c) depositing a hard mask layer over said polymer particles and said layer of said gate metal, wherein step c) comprises depositing a hard mask layer of nickel over said polymer particles and said layer of said gate metal is comprised of aluminum;

d) removing said polymer particles and portions of said hard mask layer which overlie said polymer particles such that first regions of said layer of said gate metal are exposed, and such that second regions of said layer of said gate metal remain covered by said hard mask layer;

e) etching into said first regions of said layer of said gate metal such that openings are formed into said layer of said gate metal at said first regions, said second regions of said layer of said gate metal protected from said etching by said hard mask layer; and

f) removing remaining portions of said hard mask layer which overlie said second regions of said layer of said gate metal.

6,039,622

METHOD OF FORMING BARRIER RIBS OF DISPLAY PANEL

Tadayoshi Kosaka; Osamu Toyoda, and Fumihiro Namiki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

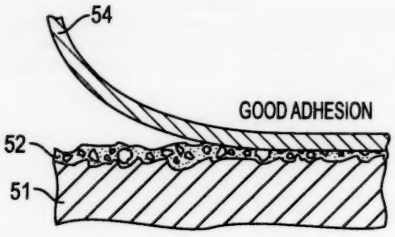
Filed Jul. 8, 1997, Appl. No. 889,195

Claims priority, application Japan, Jan. 13, 1997, 9-003975

Int. Cl.[7] H01J *9/00;9/14*

U.S. Cl. 445—52 **22 Claims**

1. A method of forming barrier ribs of a display panel comprising:



forming a layer of a dielectric paste comprising a powdery component and a binder component as a layer of a barrier rib material in a predetermined thickness on a substrate;

forming a mask pattern on the dielectric paste layer before firing;

jetting a cutting medium onto the dielectric paste layer through the mask pattern to partially cut the dielectric paste layer to thereby form a cut barrier rib layer; and

firing the cut barrier rib layer to make barrier ribs,

wherein, prior to forming the mask pattern, the unfired dielectric paste layer is coated with a bind film which does not contain a powdery component for fixing the powdery component of the dielectric paste in a free state on a surface of the unfired dielectric paste layer and then the bind film is dried.

6,039,623

DEFLECTING YOKE GRADIENT ADJUSTING APPARATUS

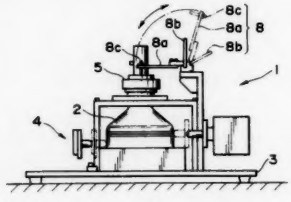
Satoshi Osuga, and Yoshihiro Inamoto, both of Saitama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 7, 1996, Appl. No. 661,403

Claims priority, application Japan, Jun. 14, 1995, 7-147250

Int. Cl.[7] H01J *9/00*

U.S. Cl. 445—63 **3 Claims**



1. A deflecting yoke gradient adjusting apparatus comprising a base for mounting a CRT, positioning means for adjusting the position of said CRT mounted on said base, horizontal positioning means for positioning said deflecting yoke positioned within said horizontal positioning means which can move in a horizontal direction toward or away from said deflecting yoke tentatively mounted on said CRT and vertical positioning means for positioning said deflecting yoke in a direction perpendicular to the surface of said base.

6,039,624

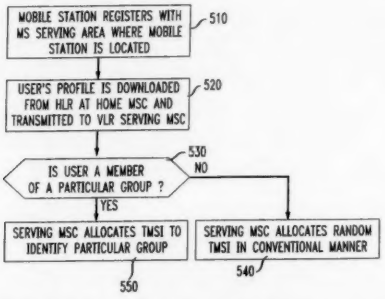
METHOD FOR ALLOCATING A MOBILE STATION TMSI

David William James Holmes, Redmond, Wash., assignor to AT&T Wireless Services Inc., Redmond, Wash.

Filed Jul. 29, 1996, Appl. No. 688,626

Int. Cl.[7] H04Q *7/20*

U.S. Cl. 445—403 **21 Claims**


MOBILE STATION REGISTERS WITH MS SERVING AREA WHERE MOBILE STATION IS LOCATED
510
USER'S PROFILE IS DOWNLOADED FROM HLR AT HOME MSC AND TRANSMITTED TO VLR SERVING MSC
520
IS USER A MEMBER OF A PARTICULAR GROUP ?
530
NO
YES
SERVING MSC ALLOCATES TMSI TO IDENTIFY PARTICULAR GROUP
550
SERVING MSC ALLOCATES RANDOM TMSI IN CONVENTIONAL MANNER
540

1. A method for operating a wireless telecommunications network, the network having associated therewith a group of at least one mobile station having an identifiable classification denoting subscriber affiliations or services, the method comprising the steps of:

(a) assigning a temporary identification number to the mobile station belonging to the identifiable classification, the temporary identification number comprising a plurality of bits; and

(b) encoding a portion of the plurality of bits based on the identifiable classification.

6,039,625

INTERACTIVE AND ANIMATED MINI-THEATER

Mai Wang, 7146 Golden Gate Dr., San Jose, Calif. 95129

Filed Oct. 23, 1998, Appl. No. 178,363

Int. Cl.[7] A63H *33/00*

U.S. Cl. 446—83 **5 Claims**

1. An animated theatre apparatus comprising:

a theatre base providing an upwardly facing base surface for use as a theatre stage for supporting at least two animated theater characters thereon;

motion producing means engaged with at least one of the animated theatre characters for enabling;

circuit means providing program storage means, mass storage means, display means, manual input control means, remote input control means, audio output means, audio input means, and voice recognition means;

a theatre program within the program storage means, the theatre program enabled for directing motion signals to the motion producing means for moving the characters and for directing signals to the display means, and the audio output means corresponding to audio information stored in the mass storage means in response to signals received by the manual and the remote control means and the audio input means, through the voice recognition means, so as to produce an interactive animated program;

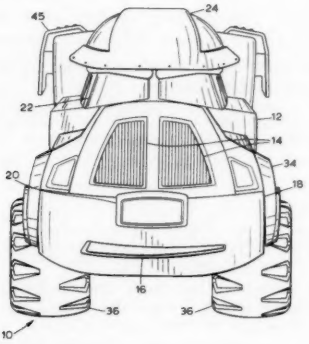
at least one of the animated characters providing means for controlling tuning and volume functions of a radio wave

receiving means interconnected with the circuit means for actuation in accordance with the theatre program and for displaying the station on the display means.

6,039,626
VOICE-ACTIVATED TOY TRUCK WITH ANIMATED FEATURES

Gregory L. Gerold, 2623 Mt. Airy Ave., Cincinnati, Ohio 45239, and Mark R. Wiesenhahn, 270 Morris Ave., Providence, R.I. 02906

Filed Sep. 11, 1998, Appl. No. 151,717
Int. Cl.[7] A63H *30/00*
U.S. Cl. 446—175 **19 Claims**



14. A voice activated toy truck comprising:

a truck chassis;

a hood supported by said truck chassis, said hood being composed of a flexible material so that said hood can readily bend;

an actuator assembly adapted to selectively cause said flexible hood to bend;

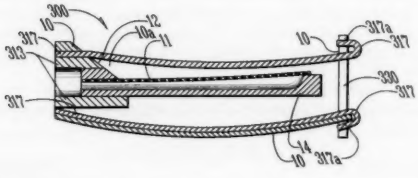
a sound detecting circuit adapted to detect sound; and

a control circuit operatively coupled to said actuator assembly and said detecting circuit, said control circuit being adapted to cause said actuator assembly to cause said flexible hood to bend in response to said sound detecting circuit detecting sound.

6,039,627
DURABLE AND EASILY OPERATED GAME CALLING DEVICE

David R. Forbes, Cedar Rapids; Dave Mortensen, Ely; Ron M Bean, Cedar Rapids, and Gregory G. Williams, Iowa City, all of Iowa, assignors to Hunter's Specialties, Inc., Cedar Rapids, Iowa

Filed May 20, 1998, Appl. No. 82,198
Int. Cl.[7] A63H *5/00*
U.S. Cl. 446—208 **1 Claim**



1. A grunt tube comprising:

a tubular member defining an axial direction and having a mouthpiece end that allows air to enter said tubular member, an outlet end that emits sound and an opening in a wall of said tubular member between said mouthpiece end and said outlet end;

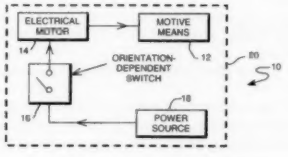
a reed that vibrates in response to passing air, said reed being disposed within said opening and having portions along the axial direction simultaneously accessible through said opening;

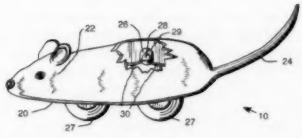
an elastic skin disposed on the inside of said wall of said tubular member to at least partially cover said opening, the elastic skin being resilient to allow selective application of pressure through the elastic skin to at least one of the simultaneously accessible portions on said reed, wherein a user can modify sounds emanating from said outlet end produced by air passing through said mouthpiece end and past said reed by selectively applying pressure to said elastic skin.

6,039,628
SELF-MOBILE CAT TOY

John H. Kusmiss, 11160 Langmuir Ave., Sunland, Calif. 91040, and Naomi Caryl, 2071 Castilian Dr., Los Angeles, Calif. 90068-2608

Continuation of application No. 08/114,821, Sep. 2, 1993, abandoned. This application Nov. 2, 1994, Appl. No. 333,602.
Int. Cl.[7] A63H *29/00*
U.S. Cl. 446—457 **15 Claims**





1. A cat toy simulating intermittent life, comprising:

a shell simulating the exterior of a small nonhuman animal defining an interior volume; and

means for intermittenly moving substantially inside said volume and attached to said shell for intermittently moving said toy along the ground, said means for intermittenly moving operable by direct mechanical actions of a cat playing with said cat toy, said actions involving actual physical contact of said cat with said toy to alter a spatial orientation of said toy.

6,039,629
NURSING PAD

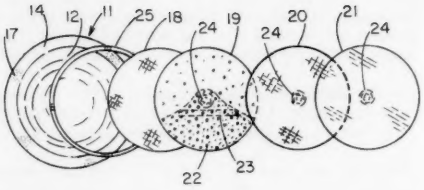
Julia Mitchell, 16 Acorn Close, Bowerdean Road, High Wycombe Buckinghamshire HP13 6XE, United Kingdom

Filed May 6, 1999, Appl. No. 307,347
Int. Cl.[7] A41C *3/04*
U.S. Cl. 450—57 **8 Claims**

8. A nursing pad adapted for attachment to a cup of a user's bra and interposed between the cup of the bra and the user's breast received in the cup of the bra, said nursing pad comprising:

a generally hemispherical exterior layer having a center region, a generally circular outer perimeter, a concave inner face, and a convex outer face;

said exterior layer having an outwardly radiating annular outer flange around said outer perimeter of said exterior layer;



said outer face of said exterior layer having an adhesive provided thereon along said outer flange of said exterior layer;

said adhesive of said exterior layer being adapted for adhesively coupling said outer flange to a cup of a bra of a user;

said exterior layer comprising a flexible water impermeable material;

said outer flange of said exterior layer having a plurality of apertures therethrough extending between said inner and outer faces of said exterior layer;

said concave inner face of said exterior layer defining a generally hemispherical inner space;

a plurality of coextensive generally hemispherical inner layers being disposed in said inner space of said exterior layer;

said plurality of inner layers comprising first, second, third and fourth inner layers each having centers coaxial with said center of said center of said exterior layer and each having a generally outer perimeter located inside and concentric with said outer perimeter of said exterior layer;

said first inner layer being positioned adjacent said inner face of said exterior layer, said second and third inner layers being interposed between said first and fourth inner layers, said third inner layer being interposed between said second and fourth inner layers;

said first and third inner layer comprising a woven fabric material;

said second inner layer comprising a water absorbing material, said second inner layer having a lower region comprising a water absorbent material having a greater absorption capacity than a remainder region of said second inner layer;

said second inner layer having a guide line displayed on a face of said second inner layer facing outwards away from said inner face of said exterior layer, said guide line being positioned between said lower region of said second inner layer and said center of said second inner layer;

said fourth inner layer comprising a water permeable material;

said second, third and fourth inner layers each having a nipple receiving depressions located at the center of the respective inner layer, said nipple receiving depressions being coextensive with one another and extending towards said exterior layer; and

an annular water impermeable seal being disposed around said outer perimeters of said inner layer and being coupled to said outer perimeters of said inner layers and to an inner periphery of said outer perimeter of said exterior layer to coupled said outer perimeters of said inner layers and said exterior layer together.

6,039,630

APPARATUS AND METHOD FOR CALIBRATING PRESSURE EXISTING BETWEEN OPTICAL FIBERS AND A POLISHING PAD DURING A POLISHING PROCESS

William Keith Chandler, Woodsboro; Nadir Shah, Elkridge; Waqar Mahmood, Odenton, and Andrei Csipkes, Savage, all of Md., assignors to Ciena Corporation, Linthicum, Md.

Filed Feb. 27, 1998, Appl. No. 31,816

Int. Cl.[7] **B24B** *49/00*

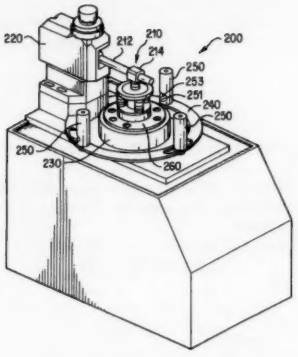
U.S. Cl. 451—6 **12 Claims**

1. A calibration apparatus for a polishing machine, comprising:

a polishing pad;

a polishing arm vertically arranged above said polishing pad;

a leveling device attached to a lower end of said polishing arm, said leveling device having a plurality of optical fiber ends



extending downwardly from a lower surface thereof for contacting said polishing pad;

a ferrule surrounding said polishing pad wherein said polishing pad is disposed within a central opening of said ferrule; and

a plurality of sensors attached to said ferrule.

6,039,631

POLISHING METHOD, ABRASIVE MATERIAL, AND POLISHING APPARATUS

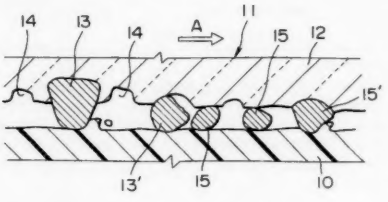
Shuzo Sato, Kanagawa, and Hiizu Ohtorii, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1998, Appl. No. 65,444

Claims priority, application Japan, Apr. 28, 1997, 9-110789

Int. Cl.[7] **B24B** *1/00;7/00;33/00*

U.S. Cl. 451—37 **9 Claims**



1. A polishing method comprising the steps of:

providing an abrasive wheel having fixed abrasive grains and particles of a pore-forming material being dispersed in a soft binder, said particles of the pore-forming material being eluted when contacted with a solvent,

polishing a surface of a member to be polished by rotating and sliding the abrasive wheel on the surface while supplying free abrasive grains to the surface of the member to be polished.

6,039,632

SOLID STATE LASERS

John Robertson, Paisley, United Kingdom, assignor to Barr & Stroud Limited, Glasgow, United Kingdom

PCT No. PCT/GB96/02592, § 371 Date Jan. 27, 1998, § 102(e) Date Jan. 27, 1998, PCT Pub. No. WO97/17746, PCT Pub. Date May 15, 1997

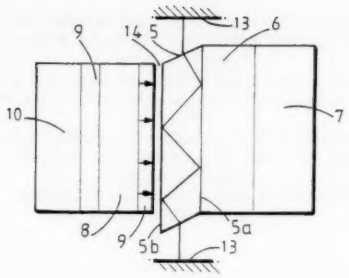
PCT Filed Oct. 22, 1996, Appl. No. 199

Claims priority, application United Kingdom, Nov. 9, 1995, 9522925

Int. Cl.[7] **B24B** *1/00;7/19;7/30*

U.S. Cl. 451—41 **5 Claims**

1. A method of reducing temperature gradients within an optically-pumped elongate solid state lasing medium, wherein the



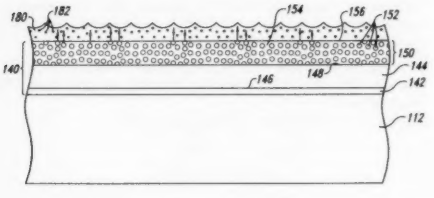
medium is in the form of a slab having a rectangular or square cross-section having two opposed faces which are polished to maximize internal reflections and to thereby support lasing and two opposed faces which are ground so as to be substantially non-reflecting faces for emitting or scattering radiation generated by amplified spontaneous emission (ASE), the method comprising treating said non-reflecting faces to reduce the amount of heat generated by ASE and by pump light radiation passing therethrough by polishing each ground face to be visually smooth and then re-roughening each such face to produce a surface finish which scatters incident light and such that the depth of surface damage at the re-roughened face is less than about five times the lasing wavelength.

6,039,633

METHOD AND APPARATUS FOR MECHANICAL AND CHEMICAL-MECHANICAL PLANARIZATION OF MICROELECTRONIC-DEVICE SUBSTRATE ASSEMBLIES

Dinesh Chopra, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 1, 1998, Appl. No. 164,916
Int. Cl.[7] B24B *1/00*
U.S. Cl. 451—41 **81 Claims**



75. A method for planarizing a microelectronic-device substrate assembly, comprising:

removing material from the substrate assembly by pressing the substrate assembly against a planarizing surface of a polishing pad in the presence of a planarizing fluid and moving at least one of the polishing pad or the substrate assembly with respect to the other; and

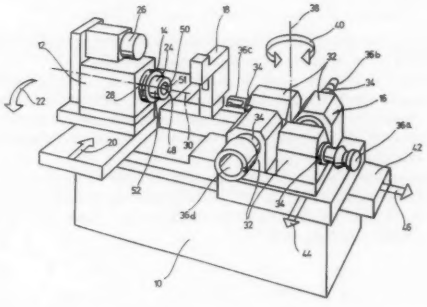
imparting at least a portion of a reaction control element to the planarizing fluid from the planarizing surface of the polishing pad to control an aspect of the interaction between the planarizing fluid and the substrate assembly.

6,039,634

HARDENED WORKPIECE FINISHING PROCESS

Guenther Bach, and Heinz Naumann, both of Besigheim, Germany, assignors to Komet Praezisionswerkzeuge Robert Breuning GmbH, Germany

PCT No. PCT/EP95/05017, § 371 Date Jun. 20, 1997, § 102(e) Date Jun. 20, 1997, PCT Pub. No. WO96/19317, PCT Pub. Date Jun. 27, 1996
PCT Filed Dec. 16, 1995, Appl. No. 878,851
Claims priority, application Germany, Dec. 21, 1994, 44 45 621
Int. Cl.[7] B24B *1/00*
U.S. Cl. 451—49 **18 Claims**



1. A method for finishing rotationally symmetrical workpiece surfaces, wherein a hardened workpiece which has been premachined leaving an overmeasure is clamped into a rotationally driven workpiece spindle of a grinding machine and is machined using a grinding tool effecting the removal of part of the overmeasure, the grinding tool rotating about a tool axis which is variably eccentric with respect to the workpiece spindle and/or to the rotationally symmetrical workpiece surface to be machined, the grinding tool further being advanceable perpendicularly to the workpiece surface and being oscillatingly displaceable parallel with respect to the workpiece surface, and wherein before the grinding process a lathe tool comprising a drill shank having a cutting edge for internal hard turning or for external hard turning is exchanged into a coaxially aligned position with respect to the workpiece spindle and/or the rotationally symmetrical workpiece surface to be machined in place of the grinding tool, the lathe tool being rotated about an axis which is aligned with respect to the axis of the workpiece spindle and being advanced axially in the direction of the workpiece while effecting a machining which removes part of the overmeasure.

6,039,635

SURFACE POLISHING APPARATUS INCLUDING A DRESSER

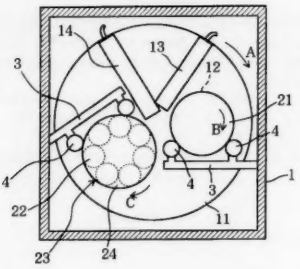
Masashige Mitsuhashi; Kenichi Ohno, and Kenichi Yoshida, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1998, Appl. No. 141,421
Claims priority, application Japan, Aug. 29, 1997, 9-234512
Int. Cl.[7] B24B *7/04*
U.S. Cl. 451—72 **13 Claims**

1. A surface polishing apparatus for polishing a surface of a work piece pressed into contact with a processing surface of a disk-shaped polishing tool of the surface polishing apparatus while rotating and supplying abrasive slurry to said processing surface, said surface polishing apparatus comprising in order:

an abrasive slurry-supply mechanism for supplying abrasive slurry to said processing surface of said disk-shaped polishing tool;

a dresser for setting said processing surface of said disk-shaped polishing tool; and



an abrasive slurry-suction mechanism for sucking and collecting said abrasive slurry on said processing surface;

wherein said work piece is positioned between said abrasive slurry-supply mechanism and said dresser such that the abrasive slurry supplied by said abrasive slurry-supply mechanism contacts said dresser prior to being sucked by said abrasive slurry-suction mechanism;

wherein said abrasive slurry-suction mechanism comprises shallow trenches which capture abrasive slurry in an outer margin of an abrasive slurry-suction surface which faces said disk shaped polishing tool.

6,039,636

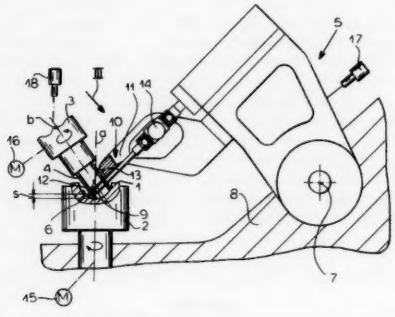
PRECISION GRINDING OF A PART-SPHERICAL RECESS

Peter C. Di Nardi, Livonia, Mich., assignor to Ernst Thielenhaus GmbH & Co. KG, Wuppertal, Germany

Filed Jul. 7, 1998, Appl. No. 110,707

Int. Cl.[7] B24B *7/00*

U.S. Cl. 451—178 **8 Claims**



1. An apparatus for precision machining a part-spherical recess of a workpiece centered on a workpiece axis, the apparatus comprising:

a workpiece holder adapted to hold the workpiece;

means for rotating the workpiece holder about a symmetry axis of the recess;

a honing tool;

means for rotating the tool about a tool axis inclined to the workpiece axis and for simultaneously urging the tool along the tool axis against a surface of the recess to hone the surface;

a spacer body displaceable generally along the workpiece axis and engageable in a use position with the surface; and

a pair of feelers mounted on the spacer body and having in the use position of the spacer body tips that are spaced along the workpiece axis from the spacer body, and symmetrically diametrally flank the workpiece axis, and engage the surface.

6,039,637

SECURITY DEVICE FOR DESTROYING THE INFORMATION BEARING LAYER AND DATA OF A COMPACT DISC

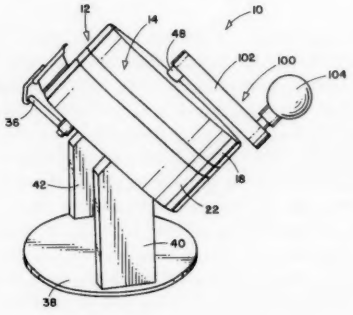
Roger S. Hutchison, Golden, Colo., and Phua Swee Hoe, Singapore, Singapore, assignors to CD-Rom USA, Inc., Golden, Colo.

Continuation-in-part of application No. 09/079,579, May 15, 1998, Pat. No. 5,954,569. This application Nov. 13, 1998, Appl. No. 192,062.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B24B *7/00*

U.S. Cl. 451—271 **40 Claims**



39. A device for removing the information bearing surface and the data carried thereby from the substrate layer of a compact disc while maintaining the integrity and identification of the substrate layer, said device comprising:

a housing defining a central cavity, said housing including a first portion defining a first cavity chamber, a second portion having an interior surface and selectively attachable to said first portion to enclose said interior surface within said cavity chamber, said interior surface being sized and shaped to engage a compact disc, and a third portion defining a second cavity chamber contiguous with said first chamber;

a mounting element for selectively securing a compact disc within said first chamber;

an abrading assembly disposed within said first chamber for physically removing the information bearing surface of a compact disc positioned on said mounting means by reducing it to particulate material;

a mechanism for biasing said abrading assembly against the information bearing surface of a compact disc positioned on said mounting element as said information bearing surface is converted to particulate material;

a grinding member disposed in said second chamber for reducing the size of said particulate material to less than 250 microns; and

an agent for actuating said abrading assembly.

6,039,638

WORK PLANARIZING METHOD AND APPARATUS

Hitoshi Nagayama, and Motoi Nezu, both of Ayase, Japan, assignors to Speedfam Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1998, Appl. No. 17,010

Claims priority, application Japan, Feb. 6, 1997, 9-038429

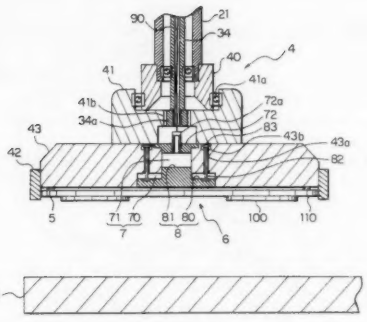
Int. Cl.[7] B24B *5/00*

U.S. Cl. 451—288 **16 Claims**

1. A work planarizing method comprising the steps of:

attaching works to a lower surface of a planar block; disposing an annular ring to encircle said works in a peripheral portion of said block;

contacting works attached to a lower surface of a planar block to a surface plate;



providing an adjustable central pressing member and outer peripheral pressing member to said block;

planarizing the surfaces of said works by rotating said surface plate while pressing the peripheral portion of said block by means of said outer peripheral pressure member through said ring and concurrently pressing said central portion of said block by said adjustable central pressure member so as to correct irregularities in the distribution of the urging force applied between an outer peripheral portion and an inner peripheral portion of each of said works, thereby applying uniform urging force to each of said works.

6,039,639

MOTOR DRIVEN HAND TOOL WITH IMPROVED ELASTIC SUPPORTING MEMBERS CONNECTING AN OSCILLATING WORK TOOL CARRIER WITH THE TOOL HOUSING

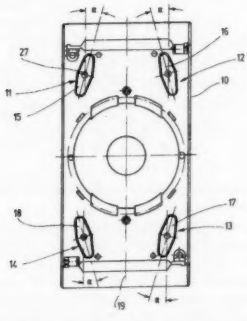
Julian Pfaundler, Gerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 20, 1998, Appl. No. 27,274

Claims priority, application Germany, Feb. 27, 1997, 197 07 938; Jan. 2, 1998, 198 00 042

Int. Cl.[7] **B24B** *23/04*

U.S. Cl. 451—356 **13 Claims**



1. A motor driven hand tool comprising a hand tool housing (**2**), an oscillatory work tool carrier (**10**) arranged on the hand tool housing (**2**) and at least one elastic supporting member (**11** to **14**,**111**, **211**, **311**, **411**, **511**) connecting the oscillatory work tool carrier to the hand tool housing (**2**) in order to hold the oscillatory work tool carrier on the hand tool housing;

wherein said at least one elastic supporting member (**11** to **14**, **111**, **211**, **311**, **411**, **511**) each comprise a one-piece plastic part, said one-piece plastic part consists of at least one approximately rod-shaped spring element (**20** to **25**; **120**,**125**; **220** to **225**, **234** and **235**; **320** to **325**; **420** to **425**; **520** to **525**) and transversely extending base parts (**15**,**26**; **115**,**126**; **215**,**226**) at opposite ends of the at least one approximately rod-shaped spring element, and said base parts contact on respective facing surfaces of the hand tool housing and the work tool carrier and are formed for releasable attachment of said at least one elastic supporting member with the hand tool housing and the work tool carrier.

6,039,640

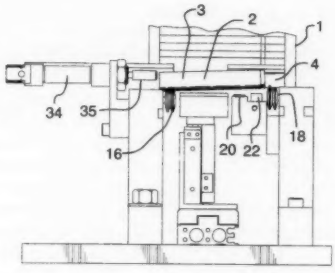
ECCENTRIC GRINDER LOADING SYSTEM

Klaus D. Woerner, Cambridge, and Allen Sommers, Waterloo, both of Canada, assignors to ATS Automation Tooling Systems Inc., Cambridge, Canada

Provisional application No. 60/030,477, Nov. 13, 1996. This application Nov. 13, 1997, Appl. No. 969,569.

Int. Cl.[7] **B24B** *19/00*

U.S. Cl. 451—460 **10 Claims**



1. Apparatus for loading an eccentric shaft in an eccentric chuck, said eccentric shaft having a main body and an eccentric end portion, comprising:

a feeder for presenting a plurality of said eccentric shafts to a pickup location one at a time;

support means for supporting one of said eccentric shaft at said eccentric end portion and at said main body remote from said eccentric end portion;

a lifting mechanism for carrying one of said eccentric shaft from said pickup location to said support means;

distance measuring means positioned opposite said main body adjacent said eccentric end portion for detecting a distance of said main body from said distance measuring means, whereby one of said eccentric shaft may be oriented by rotation to a position where said distance is oriented at a distance wherein said distance is from the group consisting of minimum and maximum distances, thereby establishing the orientation of said eccentric end portion; and

a robot for taking one of said eccentric shaft to said chuck from said support means once said main body is oriented.

6,039,641

BRAZED DIAMOND TOOLS BY INFILTRATION

Chien-Min Sung, No. 4, Lane 32, Chung-cheng Rd., Tansui, Taipei County, Taiwan

Filed Apr. 4, 1997, Appl. No. 835,117

Int. Cl.[7] **B24D** *3/06*

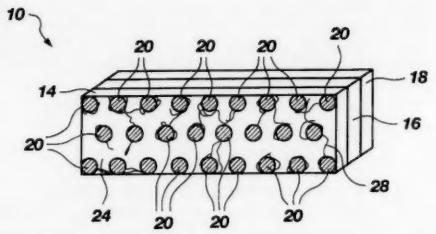
U.S. Cl. 451—540 **18 Claims**

1. An abrasive tool comprising:

a matrix support material configured for holding diamond particles to be used as abrasives;

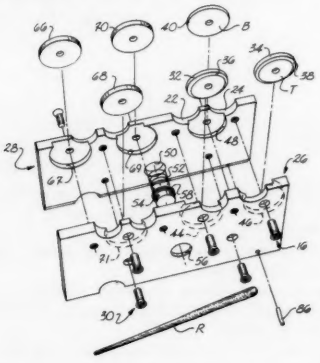
a plurality of diamond particles disposed in the matrix support material in a predetermined pattern, and

an alloy infiltrated through the matrix support material and the diamond particles, the alloy being bonded to the diamond particles and the matrix support materials, the alloy comprising a metal alloy that contains 2 to 50 percent of an element



selected from the group consisting of chromium, manganese, silicon and aluminum.

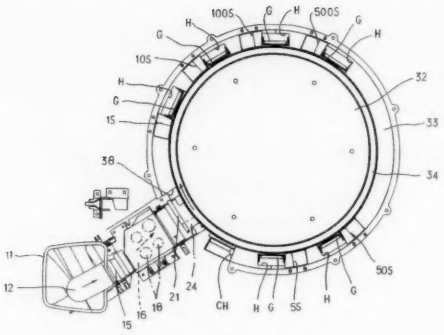
6,039,642
BLADE SHARPENER
Walter W. Collins, P.O. Box 100, North, S.C. 29112
Filed Sep. 15, 1998, Appl. No. 153,163
Int. Cl.[7] B24B *3/54*
U.S. Cl. 451—557 **18 Claims**



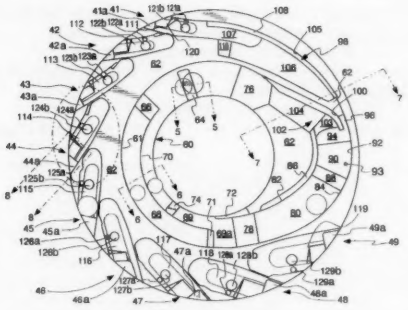
1. A sharpener for a blade, comprising:
an elongated body member;
at least two sharpening wheels mounted for rotation on said body member; a portion of each of said two sharpening wheels overlapping one another to define a first sharpening interface adapted for receiving the blade;
each of said sharpening wheels being of a generally frusto-conical shape and having a base portion and a top portion opposite said base portion, said base portion being of larger diameter than said top portion; and
said base portion of each of said sharpening wheels facing an adjacent sharpening wheel.

6,039,643
COIN DISTRIBUTOR
Motoharu Kurosawa, and Hiroshi Abe, both of Iwatsuki, Japan, assignors to Asahi Seiko Kabushiki Kaisha, Japan
Filed Feb. 24, 1999, Appl. No. 256,576
Claims priority, application Japan, Mar. 2, 1998, 10-090523; Nov. 3, 1998, 10-349299; Nov. 25, 1998, 10-375399
Int. Cl.[7] G07D *3/00*
U.S. Cl. 453—3 **9 Claims**

1. Equipment for dividing a plurality of coins, comprising:
a cover with a low big circular board form;
a slender ring for coin conveyance, which is rotatably mounted along an outside periphery of a bottom of said cover; and
a coin passage device with an approximately ring-shaped inclination board, an outside perimeter of said inclination board being higher than an inside perimeter and said inside perimeter being near an outside periphery of said ring, said coin passage device having a plurality of openings for coin division.



6,039,644
COIN SORTER
Joseph J. Geib, Mt. Prospect; Scott D. Casanova, Roselle; Douglas U. Mennie, Barrington; Richard A. Mazur, Naperville, and Gary P. Watts, Buffalo Grove, all of Ill., assignors to Cummins-Allison Corp., Mt. Prospect, Ill.
Division of application No. 08/587,849, Jan. 11, 1996, Pat. No. 5,865,673. This application Apr. 18, 1997, Appl. No. 824,474.
Int. Cl.[7] G07D *3/16*
U.S. Cl. 453—10 **20 Claims**



18. A coin sorter for sorting a plurality of coins of mixed denominations, comprising:
a coin-driving member having a resilient surface;
a stationary coin-guiding member having a coin-guiding surface opposing said resilient surface of said coin-driving member, said coin-guiding surface being positioned generally parallel to said resilient surface and defining a coin path along which said coins are guided, said resilient surface of said coin-driving member moving the coins along said coin path of said coin-guiding member;
a plurality of exit stations formed on said coin-guiding member for selectively allowing exiting of the coins based upon their respective diameters, said plurality of exit stations being along an end portion of said coin path;
an entry channel formed on said coin-guiding member for receiving said coins, said entry channel being positioned along a beginning portion of said coin path; and
means for increasing positive control over said coins adjacent to a periphery of said coin-guiding member in at least one of said plurality of exit stations, said positive control over said coins increasing toward said periphery of said coin-guiding member.

6,039,645

SOFTWARE LOADING SYSTEM FOR A COIN SORTER

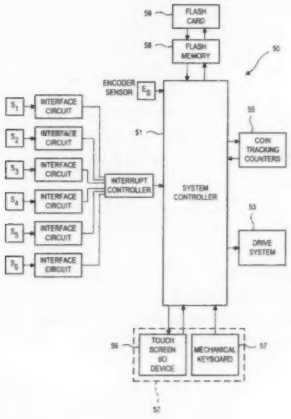
Richard A. Mazur, Naperville, Ill., assignor to Cummins-Allison Corp., Mt. Prospect, Ill.

Filed Jun. 24, 1997, Appl. No. 881,420

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G07D *3/00*

U.S. Cl. 453—10 **12 Claims**



1. A coin sorting system, comprising:

a coin sorter for sorting a plurality of coins;

a system controller coupled to the coin sorter;

an operator interface panel coupled to the system controller, said operator interface panel including a touch screen display for displaying keys associated with operation of the coin sorting system;

a resident memory coupled to the system controller and containing a first version of control software to be executed by the system controller, said first version of control software including a first display setting of the touch screen display; and

a flash card having a flash card memory containing a second version of control software to be executed by the system controller, said second version of control software including a second display setting of the touch screen display, said flash card being adapted to be removably electrically coupled to the coin sorter, said resident memory being adapted to erase the first version of control software and store the second version of control software in response to the flash card being electrically coupled to the coin sorter, said resident memory being adapted to retain the second version of control software in response to the flash card being thereafter removed from the coin sorter.

6,039,646

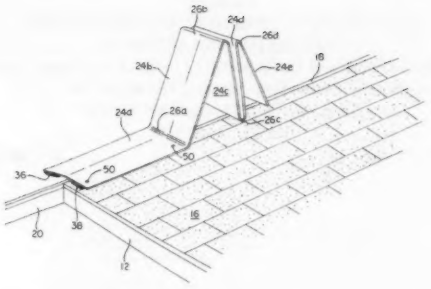
VENTILATING CAP FOR COVERING A VENT OPENING, TRANSPORT CONTAINER, AND METHOD FOR THEIR MANUFACTURE

Gary L. Sells, Mishawaka, Ind., assignor to Cor-A-Vent, Incorporated, Mishawaka, Ind.

Provisional application No. 60/069,527, Dec. 12, 1997. This application Mar. 4, 1998, Appl. No. 34,480.

Int. Cl.[7] F24F *7/02*

U.S. Cl. 454—365 **16 Claims**



1. Ventilating material for covering a vent opening in a roof of a building structure packaged for transport to the structure for installation on the roof comprising an elongated run of said venting material having passages extending there through to provide venting of the structure through said vent opening and the passages when the run of venting material is installed on the roof over the vent opening, said run of venting material being gathered into multiple interconnected layers to condense said run of venting material for transport to the building structure, one of said multiple layers constituting an outer layer, first fastening means for securing some of said layers not including said outer layer together, and second fastening means securing all of the layers together to permit the venting material to be transported to the roof and the outer layer secured to said roof after the second fastening means is released while the layers secured by the first fastening means remain secured together.

6,039,647

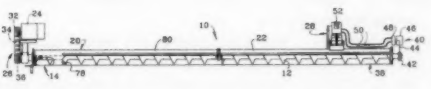
GRAIN SWEEPER DEVICE

Charles W. Weikel, Geneva, Ill., assignor to Agricultural Building Holdings, Inc., Mendota, Ill.

Filed Jun. 9, 1997, Appl. No. 871,219

Int. Cl.[7] A01D *17/02*

U.S. Cl. 460—114 **17 Claims**



1. A sweeper mechanism adapted for directing grain in a circular grain tank to a central location adjacent a center of said tank, said sweeper mechanism comprising:

a) an auger extending outwardly from said central location, said auger being adapted for rotation for directing grain within said grain tank toward said central location, said auger also being adapted to swing on a radius about said central location;

b) a frame which supports said auger;

c) a traction member coupled with the frame radially outwardly from the central opening, said traction member being adapted to engage the floor of the grain tank for driving the frame and auger about said central location;

d) a power source operatively coupled with the auger for transmitting rotational power to the auger; and

e) said traction member is operatively coupled with the auger for receiving rotational power from the auger;

f) a hydraulic pump operatively driven by an end portion of the auger opposite the central location, said hydraulic pump being operatively coupled with a hydraulic motor for driving said hydraulic motor, said hydraulic motor operatively coupled with the traction member for driving said traction member.

6,039,648

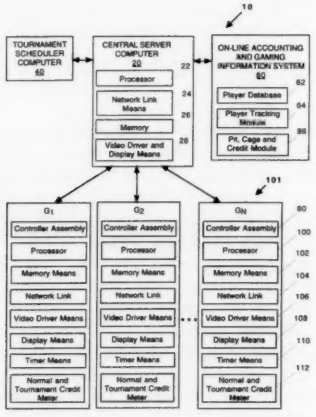
AUTOMATED TOURNAMENT GAMING SYSTEM: APPARATUS AND METHOD

Robert Guinn, and David Richards, both of Las Vegas, Nev., assignors to Casino Data Systems, Las Vegas, Nev.

Filed Mar. 4, 1997, Appl. No. 811,551

Int. Cl.[7] A63F *9/22*

U.S. Cl. 463—16 **27 Claims**



1. An apparatus for tournament play for a plurality of gaming machines, comprising, in combination:

a controller,

a processor,

means coupling said processor and controller to said plurality of gaming machines, said gaming machines including means for receiving wagers and display means for indicating a random outcome,

means for prompting potential players of the inception of a tournament,

means for enabling said plurality of machines to assume a tournament mode, and

further including a pay table display and means operatively coupled to said pay table display for dynamically changing the paytable between a normal mode and a tournament mode.

6,039,649

MONEY-OPERATED ENTERTAINMENT MACHINE

Ullrich Schulze, Wiesbaden, Germany, assignor to NSM Aktiengesellschaft, Bingen, Germany

PCT No. PCT/DE95/01547, § 371 Date Jul. 24, 1997, § 102(e) Date Jul. 24, 1997, PCT Pub. No. WO96/23287, PCT Pub. Date Aug. 1, 1996

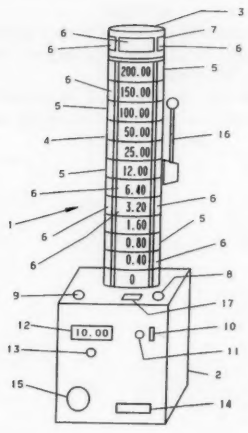
PCT Filed Nov. 3, 1995, Appl. No. 875,578

Claims priority, application Germany, Jan. 24, 1995, 195 01 955; Sep. 9, 1995, 195 33 417

Int. Cl.[7] A63F *9/24*

U.S. Cl. 463—16 **19 Claims**

1. A money-operated entertainment machine having a game device comprising a plurality of display elements displaying individual magnitudes of monetary amounts corresponding directly to a deposit of money, or a portion or multiple thereof, said magnitudes of monetary amounts representing individual wins, which can be illuminated, and having a computer-controlled control unit for controlling the course of the game, wherein the game device is



a risk game device that enables a player to directly increase a monetary amount determined by the deposit of money which directly selects a magnitude of monetary amount, or a portion or multiple thereof, when a risk of loss exists.

6,039,650

CARD DISPENSING SHOE WITH SCANNER APPARATUS, SYSTEM AND METHOD THEREFOR

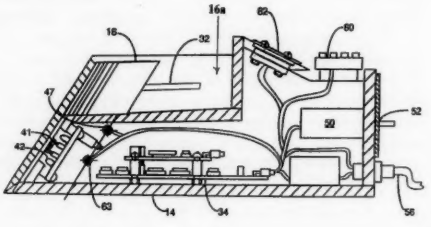
Otho Dale Hill, Las Vegas, Nev., assignor to Smart Shoes, Inc., Las Vegas, Nev.

Continuation-in-part of application No. 08/543,908, Oct. 17, 1995, Pat. No. 5,722,893. This application Feb. 26, 1998, Appl. No. 31,321.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A63F *1/14*

U.S. Cl. 463—47 **99 Claims**



2. A card delivery and player proficiency evaluation system for playing a card game comprising:

a housing configured to store a plurality of playing cards and configured for dispensing cards to a number of players;

a scanner configured to scan each of the cards dispensed from the housing and to generate a scanner signal representative of the identity of each card dispensed to the players; and

a processor coupled to the scanner and configured to process the scanner signal to count each of the cards dispensed to each of the players playing the card game and to determine at least one statistic in the play of the game relative to predetermined criteria to thereby evaluate the proficiency of the players.

6,039,651

FLEX PLATE AND FLYWHEEL CONFIGURATION

Hirotaka Fukushima, Hirakata, and Mitsuhiko Takenaka, Neyagawa, both of Japan, assignors to Exedy Corporation, Neyagawa, Japan

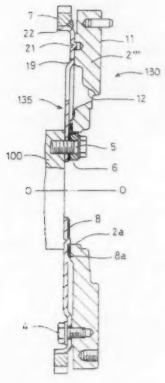
Division of application No. 08/788,802, Jan. 23, 1997. This application Aug. 14, 1998, Appl. No. 134,334.

Claims priority, application Japan, Feb. 9, 1996, 8-024151; Feb. 9, 1996, 8-024152; Feb. 9, 1996, 8-024153; Feb. 9, 1996, 8-024154

This patent is subject to a terminal disclaimer.

Int. Cl.[7] F16D *3/52*

U.S. Cl. 464—98 **5 Claims**



1. A flywheel assembly for transmitting torque from a crankshaft, comprising:

a flexible plate having a circular plate body having flexibility in a bending direction and an annular portion formed proximate an outer periphery of said flexible plate, said annular portion being offset from said circular plate body in an axial direction, said annular portion extending from said circular plate body and away from the crankshaft, said annular portion being formed with at least one protrusion that extends in an axial direction away from the crankshaft; and

a flywheel having an outer peripheral portion fixed to said annular portion such that there is an axial gap between said circular plate body and a radially inward portion of said flywheel, said outer peripheral portion of said flywheel being formed with at least one aperture located such that said protrusion extends into said aperture.

6,039,652

UNIVERSAL JOINT ANGLE DRIVING TOOL

Joel Marks, Los Angeles, Calif., assignor to WorkTools, Inc., Chatsworth, Calif.

Filed Aug. 11, 1997, Appl. No. 907,960

Int. Cl.[7] F16D *3/16;3/84*

U.S. Cl. 464—147 **4 Claims**

1. A Hookes type, double universal joint angle driving assembly including:

a rigid outer housing with openings at each of two ends and an interior cavity between the openings;

a drive shaft rotatably fitted within each opening, the drive shaft comprising a cylindrical body including a length, extending from an outer end exposed outside the housing to an inner end facing the interior cavity, a diameter and an external cylindrical surface;

a recess in the outer end of an output drive shaft, the recess able to receive a removable driven element, including a screwdriver bit;

two slots forming recesses in the cylindrical surface of the drive shaft, the slots having a bottom and two sides, the slots elongated from a first slot end to a second slot end along the length of the drive shaft, the second slot end being nearest the housing interior cavity, the two slots being opposed across the diameter of the drive shaft;

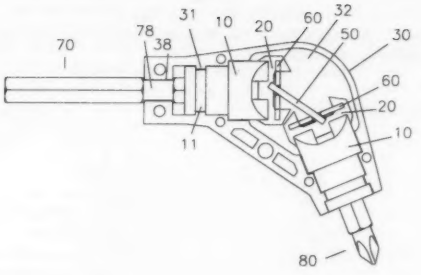
a flat endplate attached to each drive shaft, at least one endplate having an attaching end comprising two substantially parallel legs extending within the slots from the second slot end to the first slot end, and a linked end of the endplate extending into the interior cavity;

the two parallel legs spaced apart and partially surrounding the recess in the outer end;

the endplate linked end comprising two tabs, the tabs forming an end yoke;

each yoke linked to a cross member;

each cross member further linked to yokes of a center linkage, the center linkage positioned between the endplates.



6,039,653

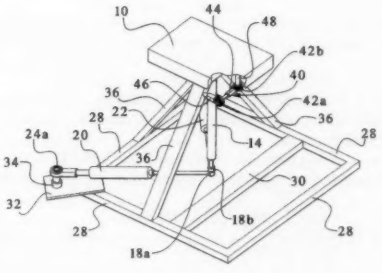
APPARATUS, SYSTEM AND METHOD FOR EXPERIENCING MOTION

Brad Engstrand, 2658 N. Dayton, Chicago, Ill. 50514

Filed Nov. 16, 1998, Appl. No. 192,788

Int. Cl.[7] A63G *31/04*

U.S. Cl. 472—59 **27 Claims**



1. An apparatus for experiencing motion, the apparatus comprising:

a frame;

a base substantially parallel to the frame in a resting position and remotely situated from the frame;

a rod extending from the base in a direction towards the frame;

a first cylinder connected between the rod and the frame; and

a second cylinder connected between the rod and the frame wherein the first cylinder and the second cylinder expand and contract to provide motion to the base and further wherein the first cylinder and the second cylinder are rotatably connected to the rod at a common end of the rod.

6,039,654

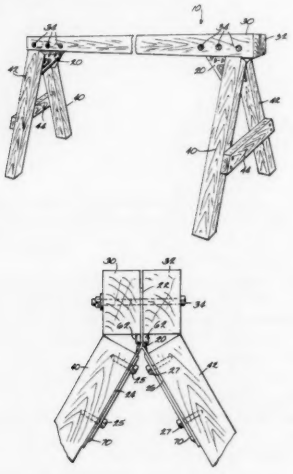
SWING SET BRACKET

Brian K. Zeilinger, Janesville, Wis., assignor to PlayStar, Incorporated, Janesville, Wis.

Filed Apr. 9, 1999, Appl. No. 289,042

Int. Cl.[7] A63G *9/00*

U.S. Cl. 472—118 **15 Claims**



1. A playstation comprising:

a Y-shaped support including,

a top section having a left side and a right side,

a lower left section extending downward from the top section,

a lower right section extending downward from the top section,

a first cross-beam secured against the left side of the top section,

a second cross-beam secured against the right side of the top section, the second cross-beam being substantially parallel to the first cross-beam,

a left leg secured to the lower left section of the Y-shaped support, and

a right leg secured to the lower right section of the Y-shaped support.

6,039,655

BOWLING GAME PLATE

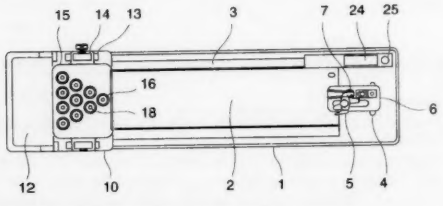
Masatoshi Todokoro, Matsudo, Japan, assignor to Staff Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1998, Appl. No. 198,532

Claims priority, application Japan, Mar. 24, 1998, 10-002830 U

Int. Cl.[7] A63D *3/02*

U.S. Cl. 473—116 **2 Claims**



1. A bowling game plate comprising:

a base plate having a lane with two sides and two ends, and gutter channels on either side of said lane;

a throwing platform provided on a first end of said lane;

a portion which receives pins provided on a second end of said lane;

a portion which collects pins, provided on a side of said portion for receiving pins which is opposite to said lane; and

a member for arranging pins which is vertically movable;

wherein fallen pins may be collected while retaining standing pins by vertically moving said member for arranging pins, pivoting said portion for receiving pins so that fallen pins are collected in said portion which collects pins while standing pins are held by said member for arranging pins.

6,039,656

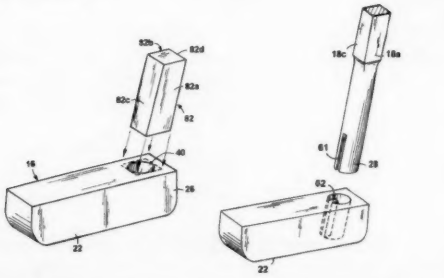
GOLF CLUB

Stephen Fireman, 10 Spooner Rd., Chestnut Hill, Mass. 02167

Continuation of application No. 08/760,418, Dec. 4, 1996, Pat. No. 5,711,719. This application Jan. 22, 1998, Appl. No. 12,082.

Int. Cl.[7] A63B *53/02*

U.S. Cl. 473—131 **5 Claims**



1. A method of assembling a golf club for striking a golf ball in a desired direction, said golf club having a straight shaft member of square or rectangular cross section having first and second pairs of opposing side surfaces extending from a distal end of the shaft member and along a substantial portion of the shaft member, the second pair of opposing side surfaces perpendicular to the first pair of side surfaces; and a head member having a flat ball striking surface and a heel portion, said head member having a square or rectangular hole sized to receive the distal end of the straight shaft member, said method comprising the steps of:

forming said shaft member wherein one of said opposing side surfaces adjacent said distal end of said shaft defines a flat alignment surface;

forming said head member with said square or rectangular hole formed completely therethrough, said hole including at least one flat surface aligned perpendicular to a distal edge disposed along said flat ball striking surface; and,

inserting said distal end of said shaft into said hole in said head member.

6,039,657

SIDE STROKING GOLF PUTTER

Bernard C. Gidney, P.O. Box 368, Ct. Pl., S. China, Me. 04358

Filed Jan. 15, 1998, Appl. No. 7,759

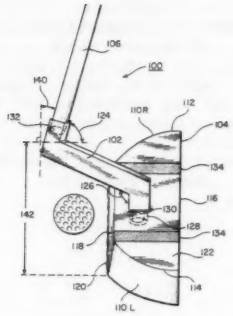
Int. Cl.[7] A63B *69/36;53/02*

U.S. Cl. 473—252 **20 Claims**

13. A croquet-styled golf putter, said croquet-styled putter to be used in a forward facing address position and comprising:

a putter head comprising at least a top surface, a bottom surface, a front face, a rear face;

a double-angle connecting section having a first upper end with a central axis forward of the front face by a distance generally greater than the diameter of a USGA regulation golf ball addressed by said putter head and substantially central to said front face, an angled section overhanging said front face, a



second lower end attached on a substantially central axis to said top surface of said putter head;

a one-handed shaft comprising a grip located substantially within a plane containing said putter head front face, said shaft section having a first upper end, a substantially straight section, a second lower end connected to said first upper end of said double-angle connecting section, and wherein said first upper end of said shaft is centrally located above said putter head.

6,039,658

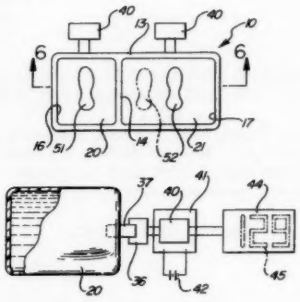
GOLF SWING WEIGHT DISTRIBUTION INDICATOR

Euclid Cecchin, 3624 Victoria Blvd., Windsor, Ontario, Canada, N9E-5E1

Filed Dec. 10, 1998, Appl. No. 209,412

Int. Cl.[7] **A63B** *69/36*

U.S. Cl. 473—269 **14 Claims**



6. A golf swing body weight distribution indicator for indicating a golfer's weight distribution at pre-determined points during a practice swing, comprising:

a pair of aligned, generally flat pads each being of a size for supporting a golfer's foot when the golfer assumes a golf swing stance, and with one of said pads being considerably smaller than the second pad and being of a size for relatively closely receiving and supporting one of the golfer's feet without any substantial lateral movement of said foot relative to the pad, and with the second pad being of a larger size to support the second of the golfer's feet while permitting relatively large lateral movements of the golfer's foot rested thereupon for enabling the golfer to freely move the leg laterally in order to assume a comfortable stance prior to swinging,

each pad being formed of a compressible material which compresses and consequently, produces pressure forces proportional to the weights applied to the pads by the golfer's feet;

each pad having a pressure force sensing device connected thereto which is calibrated for determining the weight applied to its respective pad at pre-determined times during a golf swing, such as immediately prior to the swing, at substantially the maximum back swing and at substantially the maximum forward follow-through swing;

and each pad being connected to a read-out indicator which displays the weights determined by the pad at said times;

whereby a golfer may practice and improve golf swings by observing and attempting to replicate the displayed weights during swing cycles.

6,039,659

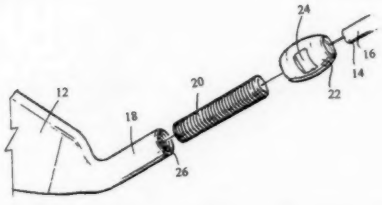
INTERCHANGEABLE SHAFT GOLF CLUB

Jack Hamm, 11190 E. Cimmarron Dr., Englewood, Colo. 80111

Provisional application No. 60/056,802, Aug. 25, 1997. This application Aug. 18, 1998, Appl. No. 136,124.

Int. Cl.[7] **A63B** *53/02*

U.S. Cl. 473—306 **7 Claims**



1. An interchangeable shaft golf club assembly comprising:

a club head, the club head including an internally threaded hosel; and

a club shaft of a select length and stiffness, the club shaft having external threads operatively associated therewith about a first end threadably engaging the internally threaded hosel; and

an internally threaded ferrule threadably receiving the external threads associated with the first end of the shaft and being threaded into abutment with a distal end of the hosel to secure the first end of the shaft within the hosel.

6,039,660

GOLF BALL

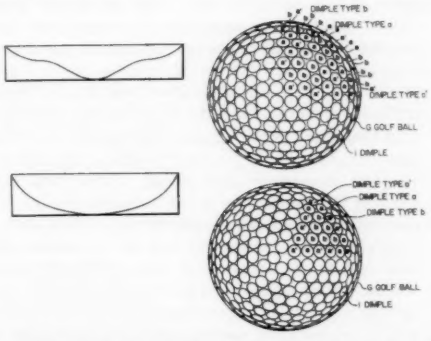
Atsuki Kasashima; Keisuke Ihara, and Hirotaka Shimosaka, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1998, Appl. No. 132,779

Claims priority, application Japan, Aug. 15, 1997, 9-235389

Int. Cl.[7] **A63B** *37/14;37/02*

U.S. Cl. 473—378 **10 Claims**



1. A golf ball having a multiplicity of dimples of circular plane shape on its surface, wherein the dimples comprise plural types of

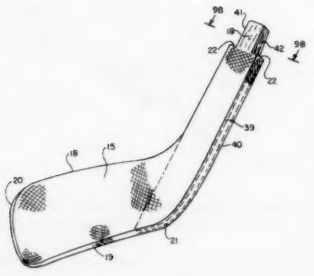
dimples having different diameters, and the dimples of at least one type having the same diameter have at least two different cross-sectional shapes with different volumes.

6,039,661

REINFORCED HOCKEY REPLACEMENT BLADE AND METHOD OF MAKING THE SAME

William D. Christian, and Roger A. Christian, both of Warroad, Minn., assignors to Christian Brothers, Inc., Warrod, Minn.

Filed Aug. 6, 1997, Appl. No. 906,599
Int. Cl.[7] A63B *59/14*
U.S. Cl. 473—562 **15 Claims**



1. A substantially wooden replacement blade adapted for insertion into the lower end of a hockey stick handle, said replacement blade comprising:

a blade portion having top and bottom edges, a pair of blade sides and toe and heel ends;

a shaft portion having a lower end extending from said blade portion, an upper end forming a connection end for insertion into a hollow lower end of a hockey stick handle, a front edge joining with the top edge of said blade portion, a back edge joining with the bottom edge of said blade portion and a pair of shaft sides extending between said front and back edges, said connection end having a free end comprising an uppermost end of shaft portion and a connection end shoulder in at least one of said front and back edges;

a reinforcement strip receiving area and a corresponding reinforcement strip shoulder on each of said pair of shaft sides, each of said reinforcement strip areas extending from said free end, past said connection end shoulder and toward said lower end of said shaft portion and extending from said back edge to its corresponding reinforcement strip shoulder, one of said reinforcement strip shoulders extending between its corresponding reinforcement strip receiving area and one of said blade sides and the other of said reinforcement strip shoulders extending between its corresponding reinforcement strip receiving area and the other of said blade sides;

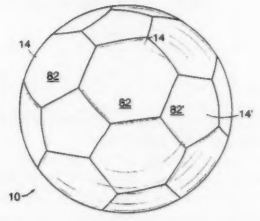
a reinforcement strip secured to each shaft side in said reinforcement strip receiving area so that each of said reinforcement strips extends from said free end, past said connection end shoulder and toward said lower end of said shaft portion, with an edge of one of said reinforcement strips adjacent to one of said reinforcement strip shoulders and an edge of the other of said reinforcement strips adjacent to the other of said reinforcement strip shoulders.

6,039,662

INFLATABLE STITCHED SPORTS BALL AND METHOD OF MAKING SAME

Chong Veng Chan, New Territories, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Joyful Long International Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

Filed Apr. 21, 1998, Appl. No. 63,555
Int. Cl.[7] H63B *41/08*
U.S. Cl. 473—604 **5 Claims**



1. An inflatable soccer ball having a body comprising:

a multiplicity of discrete panels joined together at seams along respective adjacent edges by stitching to define a volume, and

an inflatable bladder disposed within said volume and having a valve extending through an aperture defined in the outer surface of said body,

each panel of said multiplicity of panels being formed of a multi-layer laminate comprising:

an outer layer of synthetic polymeric material;

an intermediate layer of expanded synthetic polymeric material with a woven or knitted fabric; and

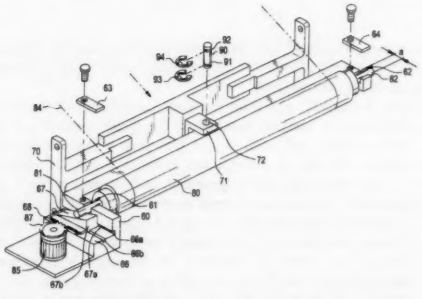
at least one inner layer of woven fabric.

6,039,663

BELT STEERING APPARATUS FOR CONTROLLING INCLINED MOVEMENT OF AN ENDLESS ROTATING BELT

Jae-yong Eum, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 27, 1998, Appl. No. 84,448
Claims priority, application Rep. of Korea, Aug. 14, 1997, 97-22233
Int. Cl.[7] F16H *7/08;7/22*
U.S. Cl. 474—103 **4 Claims**



1. A belt steering apparatus for controlling inclined movement of an endless rotating belt, comprising:

a cylindrical roller having a predetermined portion which contacts the endless rotating belt, the cylindrical roller having a rotary shaft disposed on at least one end thereof;

a first frame which supports the cylindrical roller;

a second frame hinged to the center of the first frame;

a sliding member operative to slide linearly, installed at one side of the first frame, and having an upper surface supporting the rotary shaft disposed at the one end of the cylindrical roller, the upper surface being inclined with respect to a direction of linear movement by a predetermined angle;

a rack gear provided on one side of the sliding member;

a motor having an output shaft and being mounted to the first frame; and

a pinion gear connected to the output shaft of the motor, the pinion gear contacting a predetermined portion of the rack gear to linearly move the sliding member.

6,039,664

TENSIONING DEVICE FOR TRACTION SYSTEMS SUCH AS BELTS AND CHAINS

Michael Schmid, Hochstadt, Germany, assignor to Ina Walzlarger Schaefler KG, Germany

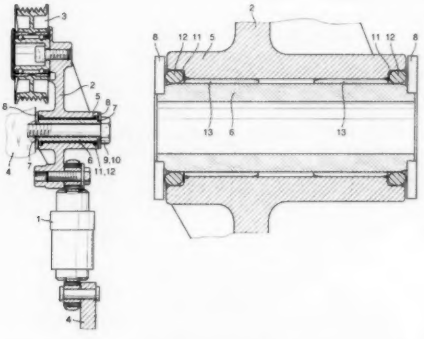
PCT No. PCT/EP96/01050, § 371 Date Dec. 15, 1997, § 102(e) Date Dec. 15, 1997, PCT Pub. No. WO97/01717, PCT Pub. Date Jan. 16, 1997

PCT Filed Mar. 12, 1996, Appl. No. 973,978

Claims priority, application Germany, Jun. 29, 1995, 195 23 647

Int. Cl.[7] **F16H** *7/12*

U.S. Cl. 474—135 **5 Claims**



5. A tensioner for a traction element for belt drives of automotive vehicles, comprising a tension roller (**3**), for a tension lever (**2**) associated with the traction roller (**3**), a mounting lug (**5**) of said tension lever (**2**) being pivoted by a radial bearing (**13**) on an axle (**6**) provided on an engine block (**4**), and axial stops for the mounting lug (**5**) being arranged on both ends of the mounting lug (**5**), the tensioner further comprising a tension spring element (**1**) acting on one end on the tension lever (**2**) and at a second end on the engine block (**4**), characterized in that sealing rings (**12**) are provided on both axial ends of the mounting lug (**5**) provided with an annular groove (**11**) on each axial end, in which annular groove (**11**) a sealing ring (**12**) is arranged, an axial depth of the annular groove (**11**) being smaller than an axial dimension of the sealing ring (**12**), which sealing rings (**12**) seal the radial bearing (**13**) at front ends thereof and project axially beyond end surfaces of the mounting lug (**5**), an axial distance between the axial stops being larger than an axial distance between the end surfaces of the mounting lug (**5**) facing the axial stops.

6,039,665

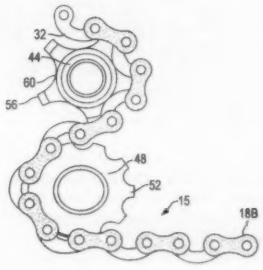
MULTIPLE SPROCKET ASSEMBLY FOR A BICYCLE

Yasushi Nakamura, Itami, Japan, assignor to Shimano, Inc., Osaka, Japan

Division of application No. 08/770,498, Dec. 20, 1996, Pat. No. 5,954,604. This application Mar. 3, 1999, Appl. No. 262,139.

Int. Cl.[7] **F16H** *7/06;55/30*

U.S. Cl. 474—157 **16 Claims**



1. A chain and a sprocket cluster in combination for use in a bicycle transmission,

wherein the chain comprises:

a plurality of intermediate links;

a plurality of pairs of outer links;

a plurality of fasteners, wherein each fastener connects an end of one of the plurality of intermediate links between a corresponding pair of outer links so that the plurality of intermediate links alternate with the plurality of pairs of outer links;

wherein each intermediate link includes a reinforcing rib extending along an intermediate portion thereof between a pair of the plurality of fasteners;

wherein each intermediate link defines a longitudinal bottom recess between each end thereof for receiving a sprocket tooth therein, the recess extending between the fasteners at each end of the intermediate link;

wherein each pair of outer links comprises first and second outer link plates facing each other, wherein each outer link plate includes a laterally curved middle portion, wherein the laterally curved middle portion of the first outer link plate curves away from the second outer link plate, and wherein the laterally curved middle portion of the second outer link plate curves away from the first outer link plate; and

wherein the sprocket cluster comprises:

a plurality of sprockets coaxially mounted together, each sprocket including a plurality of teeth for engaging the chain so that a sprocket tooth extends into the recess of each intermediate link engaging the sprocket.

6,039,666

HYDRAULIC AND MECHANICAL TRANSMISSION APPARATUS

Akihito Okuda; Koichi Fushimi, and Hiroshi Terayama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1998, Appl. No. 8,351

Claims priority, application Japan, Jan. 21, 1997, 9-008969

Int. Cl.[7] **F16H** *47/04*

U.S. Cl. 475—72 **4 Claims**

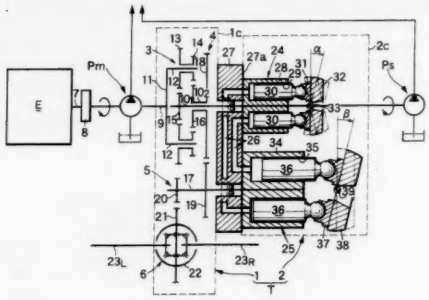
1. A hydraulic and mechanical transmission apparatus comprising:

an input shaft;

a first output shaft;

a second output shaft;

a power dividing device for dividing power inputted from a prime mover to said input shaft into a plurality of portions and transmitting the respective portions to said first and second output shafts;



a hydrostatic continuously variable transmission including a hydraulic pump driven by power outputted from said first output shaft, a hydraulic motor which communicates with said hydraulic pump through a hydraulic closed circuit, and a control panel in which said hydraulic closed circuit is formed, wherein at least one of said hydraulic pump and said hydraulic motor has a variable displacement construction;

a mechanical transmission device connected to said second output shaft,

a power collecting shaft for collecting power respectively outputted from said mechanical transmission device and said hydraulic motor and supplying the collected power to a load; and

oil supplying means for providing a supplement of oil to at least said hydraulic closed circuit,

wherein said hydraulic and mechanical transmission apparatus has a characteristic which allows a rotational speed of said first output shaft and a rotational speed of said second output shaft to decrease and increase, respectively, with an increase in a rotational speed of said input shaft, and

wherein said oil supplying means includes a first oil pump having a discharge flow rate that is proportional to the rotational speed of one of said input shaft and said second output shaft and a second oil pump having a discharge flow rate that is proportional to the rotational speed of said first output shaft.

6,039,667

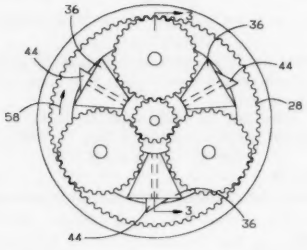
SUN GEAR LUBRICATION AND INSPECTION MECHANISM

Richard A. Schunck, New Berlin, and Gordon L. Sokolowski, Waukesha, both of Wis., assignors to The Falk Corporation, Milwaukee, Wis.

Filed Sep. 24, 1998, Appl. No. 159,454

Int. Cl.[7] F16H *57/04*

U.S. Cl. 475—159 **4 Claims**



1. A planetary sun gear lubricant system for planetary gear set comprising a sun gear having peripheral teeth, plural planet gears supported by a carrier, and a ring gear all located in a housing which acts as a sump for a lubricant, said carrier being mounted for rotation in said housing and having circumferentially spaced apart axially extending spacer members having inner and outer surfaces, the improvement comprising:

at least one of said spacer members having a passageway extending from the outer surface of said spacer to the inner surface of said spacer, the inner end of said passageway being directed toward the teeth of said sun gear,

said one of said spacer members on the outer periphery thereof having a deflector mounted thereon adjacent to the outer end of said passageway, said deflector being angled to the direction of rotation of said carrier,

said deflector being in fluid communication with said passageway whereby rotary movement of the carrier supported deflector through the lubricant within the housing causing inward deflection of the lubricant through the passageway to the teeth of said sun gear.

6,039,668

PLANET GEAR FOR HIGH REVOLUTIONS

Anders Peter Kolstrup, Skelmosevej, Denmark, assignor to Orla Kragh Jensen, Greve, and Lars Barthold Nielsen, Copenhagen, both of Denmark

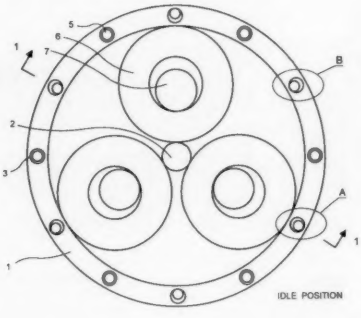
PCT No. PCT/DK96/00127, § 371 Date Sep. 26, 1997, § 102(e) Date Sep. 26, 1997, PCT Pub. No. WO96/30670, PCT Pub. Date Oct. 3, 1996

PCT Filed Mar. 28, 1996, Appl. No. 930,021

Claims priority, application Denmark, Mar. 29, 1995, 0335/95

Int. Cl.[7] F16H *13/06*

U.S. Cl. 475—183 **8 Claims**



1. A planet gear consisting essentially of a central, rotatable input axle (**1***a*); at least three planet wheels (**6**); stays (**7**); a centrally-disposed sun axle (**2**); and

a flexible outer ring (**4**) which under elastic deformation surrounds and presses the at least three planet wheels (**6**) in the form of rollers radially up against a centrally-disposed sun axle (**2**) which extends axially in line with the input axle (**1***a*), said planet wheels (**6**) having central holes and being rotatably mounted on the stays (**7**), diameters of the stays being smaller than the holes in the planet wheels, center lines of the stays being parallel with the sun axle, center lines of the stays disposed closer to the sun axle than axes of the planet wheels when the planet wheels lie up against the sun axle, the input axle (**1***a*) including a firmly connected disk-shaped driver (**1**), a side of which is provided with circular-cylindrical holes (**3**) for the engagement of circular-cylindrical studs of the flexible outer ring (**4**), the circular-cylindrical holes disposed on a pitch circle diameter which is smaller than a pitch circle diameter for the studs of the outer ring when the outer ring is in an unloaded state.

6,039,669

GEAR CHANGE FOR AN AUTOMOBILE VEHICLE

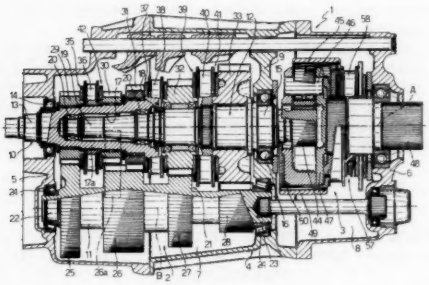
Gian Maria Pigozzi, Brescia, Italy, assignor to Iveco Fiat S.p.A., Turin, Italy

Filed Nov. 12, 1998, Appl. No. 191,286

Claims priority, application Italy, Nov. 12, 1997, T097A0991

Int. Cl.[7] **F16H** *3/091*

U.S. Cl. 475—207 **5 Claims**



1. A gear change for an automobile vehicle, in particular an industrial vehicle, of the type comprising an outer box (**4**), an input shaft (**10**) and a driven shaft (**12**) coaxial with one another, and at least one countershaft (**11**) that can be angularly coupled with the input shaft (**10**) and with the driven shaft (**12**) by means of a plurality of pairs of toothed wheels (**13**) in order to define a plurality of transmission ratios between the input shaft (**10**) and the driven shaft (**12**), the input shaft (**10**) and the driven shaft (**12**) having respective first end portions (**13**, **15**) axially opposite one another and respective second portions (**17***a*, **19**) adjacent to one another, the first portions (**13**, **15**) of these shafts being borne via bearings (**14**, **16**) by respective walls (**5**, **9**) of the box (**4**), the second portion (**17***a*) of one of these shafts (**10**) having a cavity (**17**) housing the second portion (**19**) of another one of these shafts (**12**), characterised in that it comprises two bearings (**20**) housed in the cavity (**17**), interposed between the second portions (**17***a*, **19**) of the shafts (**10**, **12**) and axially spaced from one another in order to define a relative support between these shafts (**10**, **12**), said gear change further comprising, in cascade, a main train (**2**) comprising said input shaft (**10**), the countershaft (**11**) and the driven shaft (**12**) and an epicyclic range reducer (**3**) having a sun gear (**44**) rigid with said driven shaft (**12**).

6,039,670

POWERTRAIN FOR 5-SPEED AUTOMATIC TRANSMISSIONS

Jong-sool Park, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea

Filed May 19, 1998, Appl. No. 81,565

Claims priority, application Rep. of Korea, Oct. 8, 1997, 97-51607

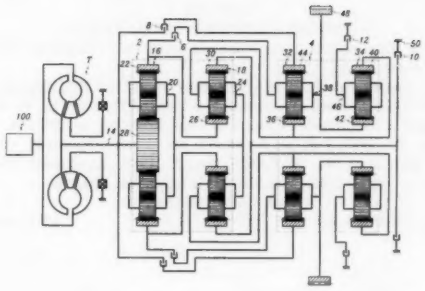
Int. Cl.[7] **F16H** *3/44*

U.S. Cl. 475—275 **42 Claims**

1. A powertrain for a 5-speed automatic transmission comprising:

a first compound planetary gearset comprising first and second simple planetary gearsets having first, second, third and fourth operating elements, said first operating element acting as an input element;

a second compound planetary gearset comprising third and fourth simple planetary gearsets having fifth, sixth, seventh and eighth operating elements, said fifth operating element acting as an output element, said fifth and sixth operating elements being variably connected to said second and first operating elements, respectively, and said seventh operating element being fixedly connected to the third operating element;



clutch means for variably connecting said fifth and sixth operating elements to said second and first operating elements, respectively; and

brake means for selectively connecting the fourth and eighth operating elements to a transmission housing.

6,039,671

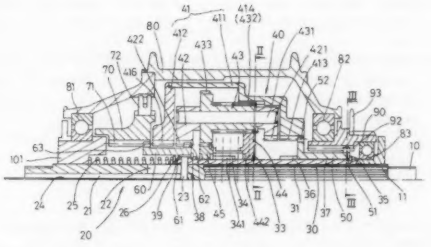
MULTI-SPEED DRIVE HUB FOR A BICYCLE

Josef Keller, Schweinfurt, Germany, assignor to Kun Teng Industry Co., Ltd., Taichung, Taiwan

Filed Feb. 9, 1999, Appl. No. 247,071

Int. Cl.[7] **F16H** *3/56*

U.S. Cl. 475—296 **10 Claims**



1. A multi-speed drive hub for bicycles, comprising:

a hub axle;

a hub sleeve mounted coaxially and rotatably on said hub axle;

an epicyclical gear unit mounted concentrically on said hub axle and having a ring gear, a planet-gear carrier, a plurality of double planet gears mounted rotatably on said planet-gear carrier, and two sun gears meshing with said double planet gears, said ring gear meshing with said double planet gears;

a drive-side coupling gear;

an output-side coupling gear connected to said hub sleeve;

first tooth means for connecting said drive-side coupling gear to one of said ring gear and said planet-gear carrier;

second tooth means for connecting said output-side coupling gear to one of said planet-gear carrier and said ring gear; and

a spring-loaded shift link mounted coaxially on and slidable axially of said hub axle and having a plurality of axially spaced radial lugs provided thereon, said drive-side coupling gear and said output-side coupling gear being connected to said shift link to be displaced therewith along said hub axle, said radial lugs engaging selectively said sun gears when said shift link is displaced along said hub axle.

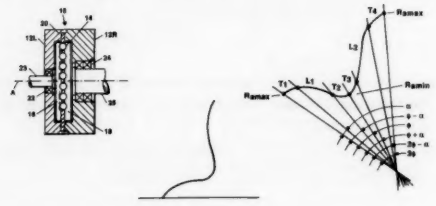
6,039,672
MODIFIED-CAM SPEED CONVERTER

Faruk Bursal, Waltham, Mass., assignor to Synkinetics, Inc., Lowell, Mass.

Continuation-in-part of application No. 08/919,135, Aug. 30, 1997, abandoned, application No. 08/815,128, Mar. 11, 1997, and a continuation-in-part of application No. 08/828,964, Mar. 27, 1997, Pat. No. 5,954,615, and a continuation-in-part of application No. 08/363,625, Dec. 23, 1994, abandoned. This application Mar. 29, 1999, Appl. No. 280,364.

Int. Cl.[7] F16H *1/48*

U.S. Cl. 476—36 **19 Claims**



1. Apparatus for translating motion from a first to a second velocity, the apparatus comprising

three drive devices, including a conjugate pair of the devices and a motion translating device, mounted about a common axis, having an input and output rotatable about the common axis,

one of the devices translating motion of a first of the devices at a first velocity to motion of a second of the devices at a second velocity, the first of the devices coupled to an input of the translating devices and the second of the devices coupled to an output of the translating device, whereby motion of the first of the devices can be translated to motion of the second of the devices,

wherein a first of the pair of conjugate devices comprises a drive cam and the second of the pair of devices comprises a driven cam,

wherein one of said cams each forms a rise flank and a fall flank, wherein a flank is formed having a main drive segment formed according to a first function and at least one transition segment formed according to a second function.

6,039,673
CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

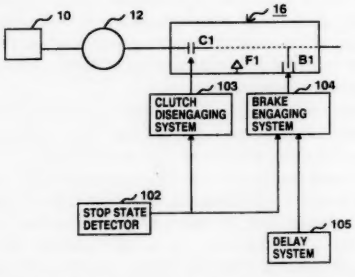
Kazuhiro Mikami; Kazuhito Yamada, and Jiro Nishiwaki, all of Anjo, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Dec. 7, 1998, Appl. No. 206,152

Claims priority, application Japan, Dec. 8, 1997, 9-337462

Int. Cl.[7] B60K *41/20*

U.S. Cl. 477—93 **7 Claims**



1. A control system for an automatic transmission which includes a hydraulic power transmission connected to an engine, a speed change unit, a clutch which is engaged when a forward driving range is selected, and a brake which is engaged to prevent a vehicle from moving backward and to thereby establish a hill-holding state in the speed change unit, said control system comprising:

a stop state detector which determines a vehicle stopped state by detection that the forward driving range has been selected, that an accelerator pedal is released and that a brake pedal is depressed;

a clutch disengaging system which provides a neutral control wherein the clutch is almost disengaged;

a brake engaging system which initiates a hill-holding control by engaging the brake; and

a delay system which delays timing of initiation of the hill-holding control until after initiation of the disengagement of the clutch by the clutch disengaging system, and which initiates said hill holding control responsive to said clutch reaching the state where it is almost disengaged.

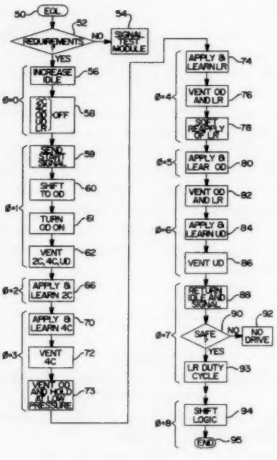
6,039,674
QUICK LEARN PROCEDURE FOR FILL VOLUMES OF AN ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

Hussein Dourra, Dearborn Heights; Gerald L. Holbrook, Rochester Hills; Colt R. Correa, Lake Orion, and David Parenti, Waterford, all of Mich., assignors to Daimler-Chrysler Corporation, Auburn Hills, Mich.

Filed Mar. 26, 1999, Appl. No. 277,444

Int. Cl.[7] F16H *61/06*

U.S. Cl. 477—166 **11 Claims**



1. A method for determining fill volumes of a plurality of clutch elements in an automatic transmission, said method comprising:

a. providing an automatic transmission attached to a vehicle engine having a plurality clutches wherein said plurality has at least 2C, 4C, LR, UD and OD clutch elements;

b. monitoring a rotational speed of a turbine within a torque converter of said automatic transmission;

c. monitoring a rotational speed of said engine;

d. applying and recording each of said plurality in a predefined order;

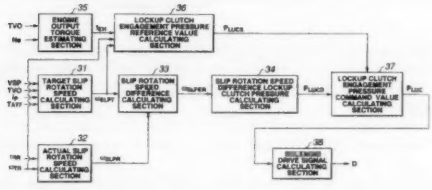
e. determining the fill volume of each of said plurality by applying each said element and recording said fill volume when said rotational speed of said engine varies from said rotational speed of said turbine by a predefined amount, wherein said fill volume of said OD clutch element is determined after said fill volume of said 2C and said 4C clutch element is determined.

6,039,675

SLIP CONTROL SYSTEM FOR TORQUE CONVERTER

Kazutaka Adachi, Yokohama, and Akira Watanabe, Kanagawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 18, 1998, Appl. No. 156,663
Claims priority, application Japan, Sep. 19, 1997, 9-254989
Int. Cl.[7] F16H *61/14*
U.S. Cl. 477—174 **11 Claims**



1. A slip control system for a torque converter with a lockup clutch, the slip control system controlling a slip rotation speed between a pump impeller and a turbine runner of the torque converter at a target slip rotation speed by controlling an engagement pressure of the lockup clutch, the pump impeller being connected to an engine to receive an engine output torque, the slip control system comprising:

a vehicle condition detector that detects an operation condition of a vehicle equipped with the torque converter and the engine;

an engine output torque determining section that determines the engine output torque on the basis of signals output from said vehicle condition detector;

a turbine runner rotation speed detector that detects a rotation speed of the turbine runner;

a reference value calculating section that calculates a reference value of the lockup clutch engagement pressure on the basis of the engine output torque as determined by the engine output torque determining section, the target slip rotation speed, and the rotation speed of the turbine runner as detected by the turbine runner rotation speed detector;

a slip rotation speed difference lockup clutch engagement pressure calculating section that calculates a slip rotation speed difference lockup clutch engagement pressure which is a change amount of the lockup clutch engagement pressure to adjust an actual slip rotation speed to the target slip rotation speed; and

a lockup clutch engagement pressure command value calculating section that obtains the sum of the lockup clutch engagement pressure reference value and the slip rotation speed difference lockup clutch engagement pressure as a lockup clutch engagement pressure command value and that outputs a signal indicative of the lockup clutch engagement pressure command value.

6,039,676

TRAINING BIKE

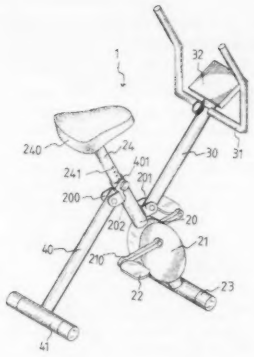
Stevens Clive, 7F, No. 291, Ta Dun 4th St., Taichung, Taiwan

Filed Sep. 7, 1999, Appl. No. 390,375
Int. Cl.[7] A63B *21/00*
U.S. Cl. 482—57 **5 Claims**

1. A training bike comprising:

a main column (**20**) having a seat post (**24**) retractably received in a first end thereof and a support bar (**23**) connected to a second end of said main column (**20**), a cycling means (**21**) connected to said main column (**20**) and a crank (**210**) rotatably connected to said cycling means(**21**);

a rear support (**40**) pivotally connected to said main column at said first end of said main column (**20**), and



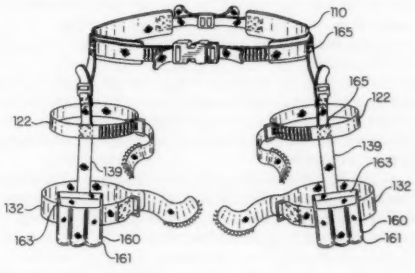
a handlebar tube (**30**) pivotally connected to said main column (**20**) at a position which is located lower than said position where said rear support (**40**) is connected to said main column (**20**).

6,039,677

EXERCISE THIGH WEIGHT SYSTEM

David Spletzer, 203 Bay 23rd St., Brooklyn, N.Y. 11214

Continuation-in-part of application No. 08/847,872, Apr. 28, 1997, Pat. No. 5,868,652, which is a continuation-in-part of application No. 08/676,941, May 6, 1996, abandoned. This application Dec. 14, 1998, Appl. No. 211,019.
Int. Cl.[7] A63B *23/04*
U.S. Cl. 482—105 **20 Claims**



1. An exercise thigh weight system, comprising:

a sturdy, semi-rigid and adjustable waist belt so as to adjust said waist belt to a waist of a user;

a right leg harness assembly attached to said waist belt and a left leg harness assembly attached to said waist belt, each said assembly harness including an upper thigh belt encircling entirely around a user's upper thigh and a lower thigh belt encircling around a user's lower thigh and a bridging member;

each said bridging member having a longitudinal axis and being fixedly connected to each said upper thigh belt at one end and fixedly connected to a weight carrying means at another end;

said upper thigh belt and said lower thigh belt being solely connected to each other by said bridging member;

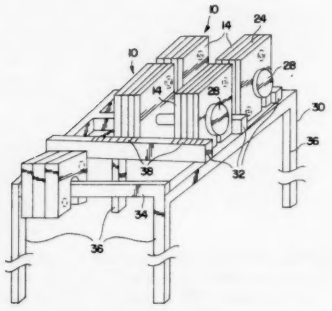
each said weight carrying means including means for securely carrying weights along the longitudinal axis of said bridging member, said weight carrying means including means for carrying at least one weight symmetrically along said bridging member, said means for carrying at least one weight being aligned along and supported by said longitudinal axis substantially centered on said bridging member so that said at least one weight is stabilized.

6,039,678

DUMBBELL SET WITH QUICK RELEASE PLATES

Fredric O. Dawson, 1719 Grant St., Santa Clara, Calif. 95050

Filed Nov. 2, 1998, Appl. No. 184,556
Int. Cl.[7] A63B *21/075*
U.S. Cl. 482—107 **6 Claims**



1. A dumbbell system which comprises:

a tube having an internal thread;

a pair of stop plates, one of said stop plates perpendicularly abutting one end of said tube opposite said other end plate perpendicularly abutting another end of said tube;

each said top plate having an aperture concentric with an opening at an end of said tube;

a pair of threaded shafts, each having a knob on one end and dimensioned to screw into said end of said tube through said stop plate;

a plurality of identical weight plates, each weight plate having an aperture dimensioned to provide that each said shaft is insertable through said aperture of said each weight plate and screwable into an end of said tube opposite said threaded shaft screwed into an opposite end of said tube providing that said weight plate be securely mountable onto said shaft by tightening said knob against said weight plate toward said respective stop plate;

each said weight plate having a straight section of an edge and said aperture in each said weight plate being centrally located;

a straight slot in each said weight plate extending perpendicularly from said straight section of said edge of said weight plate to said aperture;

at least one dimple on each weight plate forming a concavity on one side of said weight plate and a convexity on an opposite side of said weight plate arranged so that the slots of adjacent weight plates are aligned when the convexity on one plate engages the concavity on an adjacent plate;

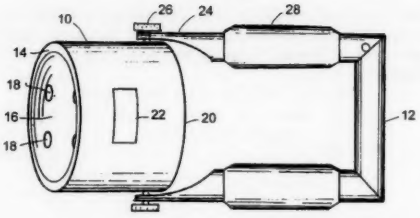
said dimple, aperture and slot in each said plate operable arranged in combination with one another and dimensioned to permit supporting said dumbbell system on a flat surface with said straight section of each plate against said flat surface whereby said slot of each weight plate is aligned with said slot of a neighboring weight plate and said dimple of each weight plate engages said dimple of a neighboring weight plate and further permitting that an additional weight plate is mountable on said dumbbell system by inserting said shaft through said slot into said aperture of said additional weight plate whereby said at least one dimple of said additional weight plate is aligned with a dimple of one of a neighboring weight plate and said stop plate.

6,039,679

ELECTRONIC DUMBBELL

Simon S. C. Yu, 3806 Whittle Ave., Oakland, Calif. 94602

Filed Aug. 9, 1999, Appl. No. 369,257
Int. Cl.[7] A63B *21/22*
U.S. Cl. 482—110 **13 Claims**



1. An electronic exercising dumbbell comprising:

a tubular main body having first and second ends, said first end having a concave surface, said second end having substantially a flat surface and supporting a plurality of function switches;

a main shaft positioned on the axis of said tubular main body, said main shaft attached between said first and said second end;

a D.C. motor in said main body, said motor spaced from and rotatable around said main shaft, the rotation of said motor around said shaft generating strong vibrations of said dumbbell;

a handle having a "U" shape and being tubular for the storage of batteries for said D.C. motor, the end of each leg of the "U" being pivotally attached across said main body; and

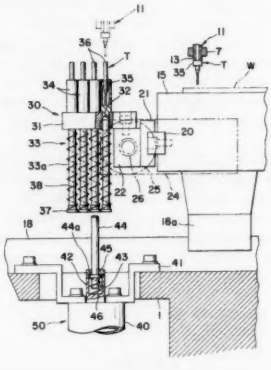
motor rotational speed controls on each leg of said "U" of said handle, said speed controls coupled between said batteries and said motor and activated by compression of said handle legs.

6,039,680

TOOL CHANGING MECHANISM

Tetsuya Oketani, Gifu, and Tadashi Uemura, Anjo, both of Japan, assignors to Howa Machinery, Ltd., Aichi-ken, Japan

Filed Jul. 17, 1998, Appl. No. 118,344
Claims priority, application Japan, Jul. 23, 1997, 9-214024
Int. Cl.[7] B23Q *3/157*
U.S. Cl. 483—57 **19 Claims**



1. A tool changing mechanism to be incorporated into a plate drilling machine having a spindle movable within in a range, said tool changing mechanism comprising:

a tool magazine including a plurality of tool posts, movable to bring one of the tool posts into alignment with the spindle;

a locating mechanism for locating the tool magazine so that one of the tool posts is brought into alignment with the spindle, said locating mechanism comprising a movable work table for mounting a plate to be drilled, and means for supporting the tool magazine on the work table to be movable relative to the work table; and

a tool pressing mechanism disposed in a fixed position on a side of the tool magazine opposite to the spindle at a tool changing

position provided in the range in which the spindle is movable, said tool pressing mechanism being operable to press said one of the tool posts aligned with the spindle toward the spindle for a tool changing operation.

6,039,681

HEATING ROLL

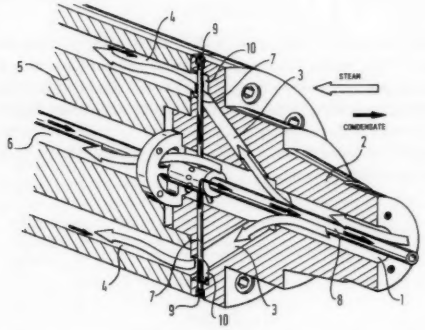
Zaoralek Heinz-Michael, Königsbronn, Germany, assignor to Schwabische Huttenwerke GmbH, Aalen-Wasseralfingen, Germany

Filed Oct. 2, 1996, Appl. No. 720,680

Claims priority, application Germany, Oct. 13, 1995, 195 38 236

Int. Cl.[7] B23P *15/00*

U.S. Cl. 492—20 **17 Claims**



1. A steam-heated roll having a longitudinal axis and a roll center, comprising substantially axially extending heating passages for heat supply and removal, and discharge passages for condensate dewatering extending substantially radially from the heating passages to the roll center, wherein said discharge passages include means for effecting a turbulent mixing of condensate and steam for maintaining the condensate mixed with the steam during passage through the discharge passages, said means for effecting including at least one cross-sectional constriction in said discharge passages.

6,039,682

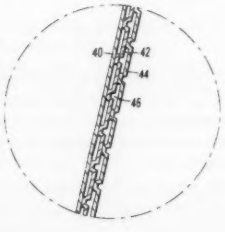
CONTAINERS FORMED OF A COMPOSITE PAPERBOARD WEB AND METHODS OF FORMING

Jerome G. Dees, Appleton, Wis., and Kirk Kimbel, Cincinnati, Ohio, assignors to Fort James Corporation, Deerfield, Ill.

Continuation of application No. 08/736,353, Oct. 23, 1996, abandoned. This application Nov. 20, 1997, Appl. No. 975,059.

Int. Cl.[7] B31B *1/88*

U.S. Cl. 493—58 **7 Claims**



1. A method of forming a composite paperboard container comprising the steps of:

providing a substantially planar sheet of paperboard material;

forming said planar sheet of paperboard material into a container configuration;

providing a first embossed sheet of paperboard material having a plurality of raised portions;

adhering said raised portions of said first embossed sheet of paperboard material to said container configuration formed by said planar sheet of paperboard material;

providing a second embossed sheet of paperboard material having a plurality of raised portions; and

adhering said raised portions of said second embossed sheet of paperboard material to said first embossed sheet of paperboard material to form a container shell.

6,039,683

BENZO(5,6)CYCLOHEPTAPYRIDINE CYCLIC UREAS AND LACTAMS USEFUL AS FARNESYL PROTEIN TRANSFERASE INHIBITORS

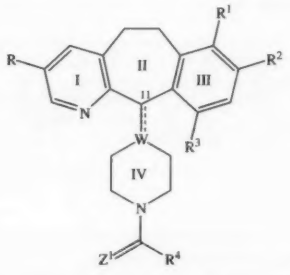
F. George Njoroge, Union; Bancha Vibulbhan, Kenilworth; Patrick A. Pinto, Morris Plains, and Viyyoor M. Girijavallabhan, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of application No. 08/877,399, Jun. 17, 1997, Pat. No. 5,852,034. This application Sep. 29, 1998, Appl. No. 162,839.

Int. Cl.[7] A61K *31/445;31/505;* **C07D** *239/04;401/14;403/14*

U.S. Cl. 574—274 **16 Claims**

1. A compound represented by the structural formula



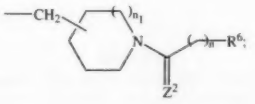
or an N-oxide thereof, or a pharmaceutically acceptable salt or solvate thereof, wherein:

R and R^2 are independently selected from halo;

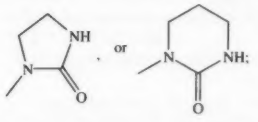
R^1 and R^3 are independently selected from the group consisting of H and halo, provided that at least one of R^1 and R^3 is H;

W is CH or C when the double bond is present at the C-11 position;

R^4 is $-(CH_2)_n-R^5$ or



R^5 is



R^6 is R^5

Z^1 and Z^2 are independently selected from the group consisting of =O and =S;

n is 1–6; and

n_1 is 0 or 1.

6,039,684

NON-LETHAL CONDITIONING METHODS FOR THE TREATMENT OF ACQUIRED IMMUNODEFICIENCY SYNDROME

Suzanne T. Ildstad, Wynewood, Pa., and Olav B. Bergheim, Laguna Hills, Calif., assignors to Allegheny University of the Health Sciences, Philadelphia, Pa., and Chimeric Therapies, Inc., Costa Mesa, Calif.

Filed Dec. 11, 1997, Appl. No. 988,832

Int. Cl.[7] A61N *5/00*

U.S. Cl. 600—1 **10 Claims**

1. A method for reducing HIV viral burden comprising:

selecting an HIV-infected human subject having acquired immunodeficiency syndrome, and

administering to the subject a non-lethal dose of irradiation to reduce HIV viral burden in the subject.

6,039,685

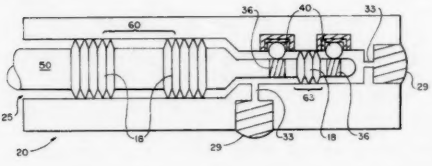
VENTABLE CONNECTOR WITH SEALS

Donald J. Bushek, Plymouth, Minn., assignor to St. Croix Medical, Inc., Minneapolis, Minn.

Filed Sep. 14, 1998, Appl. No. 152,332

Int. Cl.[7] H04R *25/00*

U.S. Cl. 600—25 **36 Claims**



1. A device for making an electrical connection between electrical components, the device comprising:

a lead housing, defining at least one lead channel with an open first end and a closed second end, the lead channel including surfaces defining at least one venting bore, and including at least one contact to make electrical connection with a lead; and

a lead, with at least one seal designed to engage and seal the lead channel, and including at least one contact to make electrical connection with the contact of the lead channel.

6,039,686

SYSTEM AND A METHOD FOR THE LONG TERM CURE OF RECURRENT URINARY FEMALE INCONTINENCE

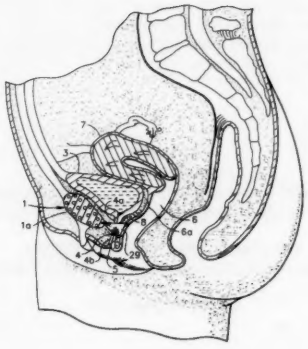
S. Robert Kovac, 411 Stonehaven, Kettering, Ohio 45429

Continuation-in-part of application No. 08/820,053, Mar. 18, 1997, abandoned. This application Jul. 8, 1998, Appl. No. 111,525.

Int. Cl.[7] A61B *19/00*

U.S. Cl. 600—30 **34 Claims**

1. A pubic bone-mounted urethra stabilization and support system for the long term cure of recurrent female urinary incontinence, said system comprising a pair of anchors adapted to be affixed to the posterior/inferior pubic bone to either side of the symphysis pubis, a surgical sling means adapted to be passed behind and about the urethra and the endopelvic fascia therebehind, for replacing damaged pubourethral ligaments and for supporting the urethra in its normal anatomic retropubic position said surgical sling means having spaced lateral end portions, each of said anchors operatively engaging one of said sling end portions, and adjustment means to position said surgical sling means relative to said anchors for restoring, supporting and stabilizing functional urethral continence anatomy and to prevent urethral descent under intraabdominal pressure.



6,039,687

RECTOSCOPE WITH SEMI-REFLECTIVE TUBE SURFACE

Karl Storz, deceased, late of Tuttlingen, Germany, by Sybill Storz-Reling, executrix, assignor to Karl Storz GmbH & Co. KG, Germany

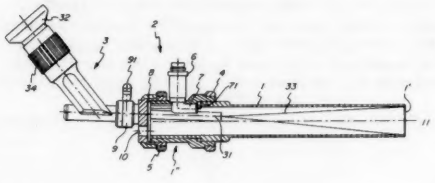
PCT No. PCT/DE96/01989, § 371 Date Jul. 13, 1998, § 102(e) Date Jul. 13, 1998, PCT Pub. No. WO97/14287, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 18, 1996, Appl. No. 51,836

Claims priority, application Germany, Oct. 19, 1995, 295 16 561

Int. Cl.[7] A61B *1/06*

U.S. Cl. 600—135 **12 Claims**



1. A rectoscope for examination of a body comprising:

a wide-lumen tube (**1**) having a distal opening (**1'**) which can be inserted into the body;

a light conductor connection (**6**) for transmitting light into said wide-lumen tube (**1**);

a viewing optic (**3**) which can be focused on a center region of the distal opening (**1'**) of said wide-lumen tube (**1**); and

substantially an entire internal side of said wide-lumen tube (**1**) having a semi-reflecting surface such that said internal side of said tube conducts light from said light conductor connection toward the distal opening (**1'**).

6,039,688

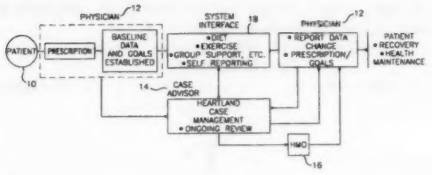
THERAPEUTIC BEHAVIOR MODIFICATION PROGRAM, COMPLIANCE MONITORING AND FEEDBACK SYSTEM

Peter Douglas, Montecito, Calif.; Evan Dudik, Vancouver, Wash.; John Evans, Pittstown, N.J., and Alan Kritzer, Van Nuys, Calif., assignors to Salus Media Inc., Sherman Oaks, Calif.

Provisional application No. 60/029,862, Nov. 1, 1996, Provisional application No. 60/052,222, Jul. 11, 1997. This application Oct. 31, 1997, Appl. No. 962,238.

Int. Cl.[7] A61B *3/00;* **G06F** *15/00*

U.S. Cl. 600—300 **34 Claims**



1. A method for monitoring compliance with a therapeutic behavior modification program, the method comprising the steps of:

providing a therapeutic behavior modification program having a series of milestones for a patient;

inputting patient data at prescribed times;

correlating the patient's data using a microprocessor with the milestones in the therapeutic behavior modification program to determine whether the patient is complying with the program; and

grouping particular data using the microprocessor and linking the data to a remote computer.

6,039,689

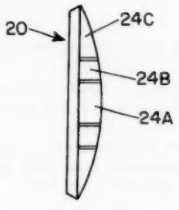
STRIPE ELECTRODE TRANSDUCER FOR USE WITH THERAPEUTIC ULTRASONIC RADIATION TREATMENT

Frederic Lizzi, Tenafly, N.J., assignor to Riverside Research Institute, New York, N.Y.

Filed Mar. 11, 1998, Appl. No. 38,632

Int. Cl.[7] A61B *8/00*

U.S. Cl. 600—439 **10 Claims**



1. Apparatus for providing therapeutic ultrasonic radiation for treatment of tissue, comprising:

a transducer in the shape of a partial sphere formed of piezoelectric material having first and second radially separated surfaces;

a conductive electrode on each of said surfaces, at least one of said electrodes being segmented into electrode segments said electrode segments including segments on opposite sides of a central plane;

and a circuit for selectively providing electrical signals to said electrodes to provide ultrasonic radiation patterns at a focal plane of said transducer which provide a narrow beam width of thermal effect in said central plane and a broad beam width of thermal effect in a plane which is perpendicular to said central plane.

6,039,690

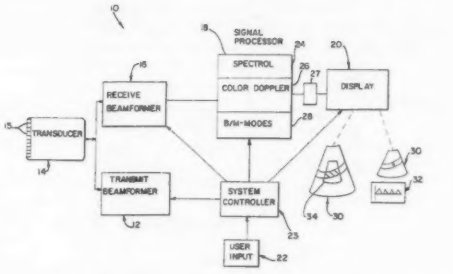
METHOD AND APPARATUS FOR FREQUENCY CONTROL OF AN ULTRASOUND SYSTEM

Gregory L. Holley, Mountain View, and Paul E. Chandler, Santa Cruz, both of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Division of application No. 08/904,829, Aug. 1, 1997, and a continuation-in-part of application No. 08/877,148, Jun. 17, 1997, abandoned. This application Sep. 17, 1998, Appl. No. 156,157.

Int. Cl.[7] A61B *8/00*

U.S. Cl. 600—440 **12 Claims**



1. A method for acquiring data representing a subject during an imaging session with an ultrasound system, said method comprising the following acts:

(a) obtaining M-mode image data representing said subject and responsive to a harmonic receive center frequency of a fundamental transmit frequency during said imaging session, said subject being free of ultrasound contrast agent throughout the entire imaging session; and

(b) displaying at least a M-mode image responsive to said M-mode data.

6,039,691

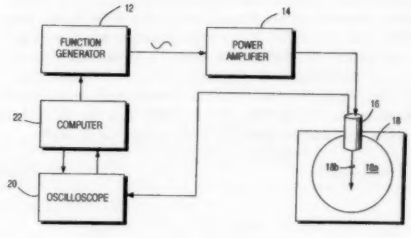
KINETIC ACOUSTIC OCULAR EXAMINATION APPARATUS AND METHOD

William F. Walker, Charlottesville, Va.; Cynthia A. Toth, and Richard E. Davidsen, both of Durham, N.C., assignors to Duke University, Durham, N.C., and Novason Corporation, Charlottesville, Va.

Provisional application No. 60/048,434, Jun. 2, 1997. This application May 29, 1998, Appl. No. 87,148.

Int. Cl.[7] A61B *8/00*

U.S. Cl. 600—452 **21 Claims**



1. A method of examining relatively soft biological tissue comprising the steps of:

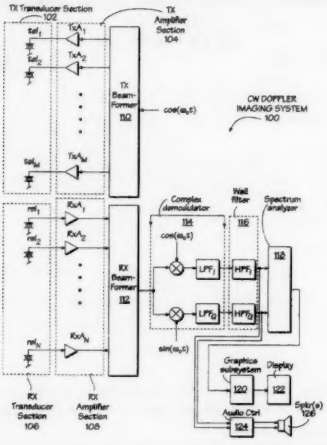
(a) generating a series of ultrasound pulses and directing said series of ultrasound pulses into relatively soft biological tissue such that at least one of the pulses is of sufficiently high intensity to induce physical displacement of the tissue; and

(b) imaging the physically displaced tissue.

6,039,692
METHOD AND APPARATUS FOR PROCESSING ULTRASOUND SIGNALS

Kjell Kristoffersen, Oslo, Norway, assignor to Vingmed Sound A/S, Horten, Norway

Filed Jun. 19, 1998, Appl. No. 99,919
Int. Cl.[7] A61B *8/00*
U.S. Cl. 600—454 **44 Claims**



1. A circuit in an ultrasound system to process signals within the frequency band of a Doppler signal, said circuit comprising:

an input circuit to receive an input signal, said input signal comprising a first component and a second component;

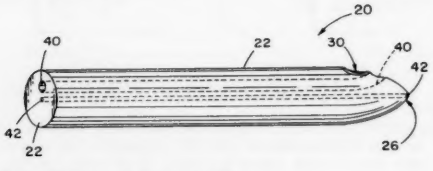
a signal generator coupled to said input circuit, said signal generator generates an approximation signal of said first component; and

a subtractor coupled to said input circuit and to said signal generator, said subtractor subtracts said approximation signal from said input signal to provide an output signal, wherein said output signal represents an approximation of said second component.

6,039,693
VOLUMETRIC IMAGE ULTRASOUND TRANSDUCER UNDERFLUID CATHETER SYSTEM

James Bernard Seward, and Abdul Jamil Tajik, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Continuation of application No. 09/003,248, Jan. 6, 1998, which is a continuation of application No. 08/678,380, Jun. 28, 1996, Pat. No. 5,704,361, which is a continuation-in-part of application No. 08/305,138, Sep. 13, 1994, abandoned, which is a continuation of application No. 07/972,626, Nov. 6, 1992, Pat. No. 5,345,940, which is a continuation-in-part of application No. 07/790,580, Nov. 8, 1991, Pat. No. 5,325,860. This application May 29, 1998, Appl. No. 87,419.
Int. Cl.[7] A61B *8/12*
U.S. Cl. 600—459 **38 Claims**



1. A catheter apparatus, comprising:

an elongated body having a longitudinal axis;

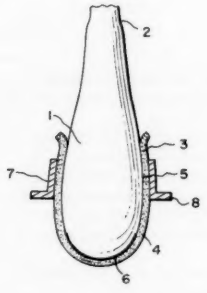
an ultrasonic transducer array longitudinally mounted on the body, the array being operated for transmitting ultrasonic signals for imaging; and

an electrical conductor disposed in the body for electrically connecting the array to a control circuitry.

6,039,694
COUPLING SHEATH FOR ULTRASOUND TRANSDUCERS

Margaret J. Larson, Lummi Island; John W. Rutter, Bellingham, and Larry L. Smith, Seattle, all of Wash., assignors to Sonotech, Inc., Bellingham, Wash.

Filed Jun. 25, 1998, Appl. No. 104,686
Int. Cl.[7] A61B *8/14*
U.S. Cl. 600—459 **35 Claims**



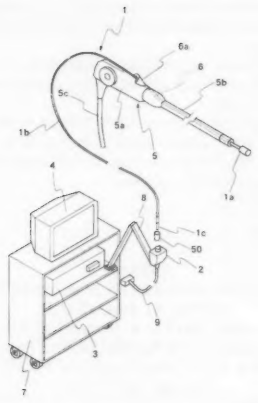
1. A homogeneous, elastic, ultrasound coupling sheath having a shape which is conformal to a medical ultrasound transducer, said sheath comprising a hydrophilic block co-polymer and 20 wt. % to about 95 wt. % biocompatible liquid and having acoustic properties generally equivalent to acoustic properties of a predetermined target, said sheath being lubricous when in contact with said target and providing a microbial barrier between said transducer and said target when said sheath is conformed to said transducer and placed in contact with said target, said sheath being replaceable and disposable.

6,039,695
PROBE COUPLER FOR ULTRASOUND EXAMINATION SYSTEM

Toshio Sakamoto; Toshizumi Tanaka; Hiromu Itoi, and Masatoshi Yoshihara, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jul. 8, 1998, Appl. No. 111,794
Claims priority, application Japan, Jul. 24, 1997, 9-212716
Int. Cl.[7] A61B *8/12*
U.S. Cl. 600—459 **8 Claims**

1. An ultrasound probe coupler for an ultrasound probe of an ultrasound examination system having an ultrasound scanner assembly attached to a nose end of a flexible cord, said ultrasound scanner assembly having an ultrasound transducer element hermetically accommodated within an end cap and said flexible cord being detachably connectable at a tail end thereof to a rotational drive shaft provided on a probe control unit and serving also as an electrode on the side of said probe control unit thereby to remote-control rotation of said ultrasound transducer element for radial scans, said flexible cord member being largely composed of a flexible outer tube and a flexible transmission shaft fitted in said flexible outer tube for rotation therein, said flexible outer tube having a fore end portion thereof detachably connected to said end cap of said ultrasound scanner assembly, and said flexible transmission shaft having a fore end portion thereof connected to said ultrasound transducer element to transmit rotation thereto and



internally providing a passage for a signal cable to said ultrasound transducer element, said probe coupler comprising:

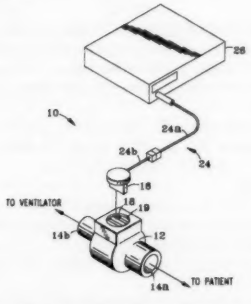
a tail end connector adapted to be provided at said tail end of said flexible cord for connection to said probe control unit, said tail end connector having an electrode member adapted to be provided at a proximal end of said flexible transmission shaft and connected to said signal cable, a stationary ring adapted to be fixedly provided on a tail end portion of said flexible cord, and a rotational coupler for coupling said flexible transmission shaft with a rotational drive means on the part of said probe control unit, said rotational coupler having a rotation transmission pin detachably connected to a lateral side of a projected proximal end portion of said electrode member and projected radially outward of inner periphery of said stationary ring for engagement with a rotational drive means on the part of said probe control unit, said rotation transmission pin being adapted to block axial movements of said electrode member within said stationary ring while transmitting rotation from said rotational drive shaft on the part of said probe control unit to said electrode member.

6,039,696

METHOD AND APPARATUS FOR SENSING HUMIDITY IN A PATIENT WITH AN ARTIFICIAL AIRWAY

Craig J. Bell, E. Swanzey, N.H., assignor to Medcare Medical Group, Inc., East Swanzey, N.H.

Filed Oct. 31, 1997, Appl. No. 962,019
Int. Cl.[7] A61N *5/00*
U.S. Cl. 600—532 **29 Claims**



29. A method for monitoring humidity in a patient with an artificial airway comprising the steps of

installing an Rh sensor humidity sensing device selected from the group consisting of capacitive type and resistive type of Rh sensor technology, in an inspiratory limb of a breathing circuit of said artificial airway in humidity sensing communication with the patient's airflow;

monitoring humidity readings of inspired gas delivered to the patient taken by said Rh sensor humidity sensing device; and

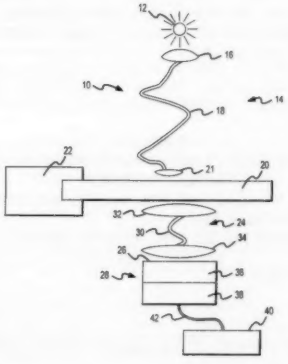
trending the Rh of these inspiratory gases allowing the use of said capacitive type and resistive type of Rh sensor technology.

6,039,697

FIBER OPTIC BASED MULTICOMPONENT INFRARED RESPIRATORY GAS ANALYZER

Thomas A. Wilke, Boulder, and Ziyi Wang, Louisville, both of Colo., assignors to Datex-Ohmeda, Inc., Louisville, Colo.

Filed Mar. 20, 1998, Appl. No. 45,453
Int. Cl.[7] A61B *5/00;5/08;* **G01J** *5/00;5/02*
U.S. Cl. 600—532 **36 Claims**



1. An apparatus for monitoring the composition of a main respiratory gas stream of a patient, said apparatus comprising:

a broad band infrared source capable of producing infrared light having a spectral content distributed at least across a wavelength range from about 4 microns to about 8 microns;

means for detecting infrared signals at a plurality of wavelengths within said wavelength range; and

means for transmitting light between said broad band infrared source and said means for detecting, said light being transmitted at least partially through a respiratory gas conduit outside the patient such that said main respiratory gas stream at said patient can be analyzed free from the need to divert a side stream therefrom for purposes of composition analysis, the main respiratory gas the conduit being adapted for flow of the main respiratory gas stream therethrough, said means for transmitting including fiber optics for transmitting infrared light within said wavelength range.

6,039,698

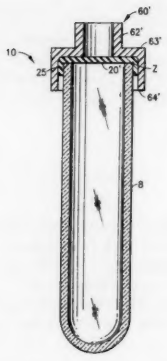
METHOD AND APPARATUS FOR REMOVING BARRIER-TYPE CLOSURES FROM BLOOD COLLECTION TUBES

Henry F. Miller, Clifton, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 30, 1998, Appl. No. 165,588
Int. Cl.[7] A61B *10/00*
U.S. Cl. 600—576 **12 Claims**

1. In a blood collection tube having an open upper end defined by a perimetrical rim of said tube and a cover having a top surface and a bottom surface and positioned over the open end of said tube, said bottom surface being secured to said rim, a method of lifting said cover from said rim comprising the steps of:

positioning a cap over said cover, said cap being attached to said cover at a location spaced from said rim; and



exerting a force on said cap, in a removal direction, said force being transferred to said cover at said attached location spaced from said rim.

6,039,699

STIFF CATHETER GUIDEWIRE WITH FLEXIBLE DISTAL PORTION

Fernando M. Viera, Hialeah, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jan. 22, 1996, Appl. No. 589,627

Int. Cl.[7] A61B *5/00*

U.S. Cl. 600—585 **22 Claims**

1. A guidewire comprising:

a) an elongated corewire formed from a first material; and

b) an elongated sleeve secured to the corewire such that at least a majority length of the sleeve surrounds at least a portion of the corewire, the sleeve formed from a second material having a relatively greater stiffness than the first material.

6,039,700

DOCKING ASSEMBLY FOR THE EXTENSION OF A GUIDEWIRE

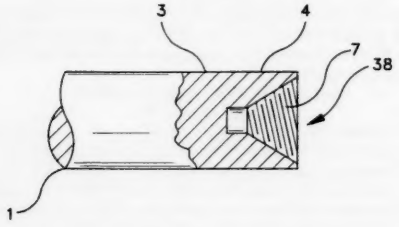
Herbert Sauter, Winkel-Rüti, Switzerland, assignor to Schneider (Europe) A.G., Switzerland

Filed Dec. 12, 1996, Appl. No. 764,531

Claims priority, application European Pat. Off., Jun. 25, 1996, 96110222

Int. Cl.[7] A61B *5/00*

U.S. Cl. 600—585 **3 Claims**



1. A guidewire extension system, comprising:

a flexible guidewire having a distal end, a proximal end, and a conical female screw thread disposed proximate the proximal end thereof;

a flexible extension wire having a distal end, a proximal end, and a conical male screw thread disposed proximate the distal end thereof; and

the conical male screw thread being adapted to releasably mate with the conical female screw thread to form a temporary connection between the proximal end of the guidewire and the distal end of the extension wire.

6,039,701

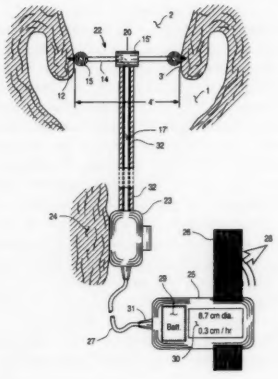
METHOD AND APPARATUS FOR MONITORING CERVICAL DIAMETER

Jack Sliwa, Los Altos, and Lee A. Blumenfeld, San Carlos, both of Calif., assignors to OB Inovations, Inc., San Carlos, Calif.

Filed Sep. 5, 1996, Appl. No. 706,575

Int. Cl.[7] A61B *5/00*

U.S. Cl. 600—588 **70 Claims**



1. A cervimeter comprising:

a loop element which is adapted to be securable to a cervix in a human female, wherein a peripheral length of the loop varies directly with a change in cervical size; and

a gauge coupled to the loop element for measuring the change in loop dimension wherein the gauge is calibrated to show cervical dilation.

6,039,702

MICROCONTROLLER BASED MASSAGE SYSTEM

Stanley Cutler, Van Nuys; Gayle B. Gerth, Dana Point, both of Calif.; Alton B. Otis, Jr., Port Townsend, Wash., and Taylor Chau, Cerritos, Calif., assignors to JB Research, Inc., Bellflower, Calif.

Provisional application No. 60/022,977, Aug. 2, 1996. This application Jul. 28, 1997, Appl. No. 901,374.

Int. Cl.[7] A61H *1/00;23/02*

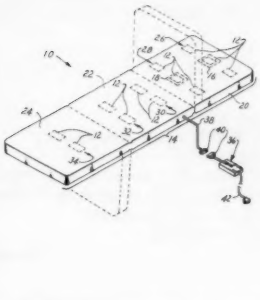
U.S. Cl. 601—15 **21 Claims**

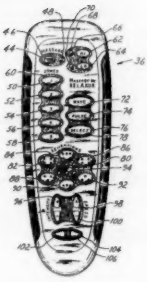
1. A method for massaging a user contacting a pad, using electrical power from a source having a voltage drop as loads are added, the method comprising the steps of:

(a) providing a plurality of eccentric motor vibrators in respective regions of the pad;

(b) providing a microprocessor controller, an array of input elements for interrogation by the controller, and a plurality of drivers for powering the vibrators from the power source in response to the controller;

(c) interrogating the input elements by the controller to determine an intensity control value and vibrators to be activated;





(d) determining a maximum duty cycle being a base duty cycle plus a load increment duty cycle for each of the vibrators to be activated; and

(e) periodically activating the drivers for producing respective operating duty cycles of activated motors being responsive to the intensity control value and limited to the maximum duty cycle.

6,039,703

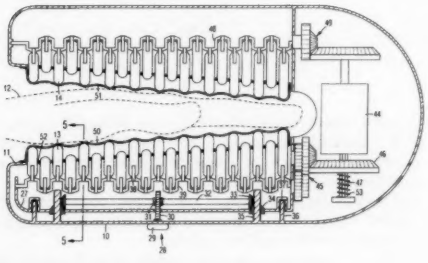
DOUBLE-SIDED MASSAGER

Bernard Badilla, 551 Peralta Ave., San Francisco, Calif. 94110

Filed May 14, 1998, Appl. No. 78,777

Int. Cl.[7] A61H *23/02*

U.S. Cl. 601—61 **9 Claims**



1. A double-sided massager, comprising:

a housing;

a slot extending into said housing for receiving a body part of a person;

a plurality of massaging members arranged on opposite sides of said slot for simultaneously massaging opposite sides of said body part; and

an additional housing with an additional slot and additional massaging members for massaging an additional body part, said housing and said additional housing being hinged together and adjustable in angle relative to each other for enabling said person to position said body part at a comfortable angle relative to said additional body part.

6,039,704

HEAD AND FACIAL MASSAGING APPARATUS

Pierluigi Domenighini, Lallio, and Matteo Clapis, Seriate, both of Italy, assignors to Italian Beauty Inovations, Inc., New York, N.Y.

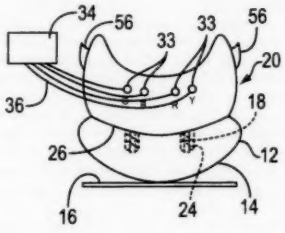
Filed Jun. 25, 1998, Appl. No. 104,380

Int. Cl.[7] A61H *1/00*

U.S. Cl. 601—79 **20 Claims**

1. A head and facial massaging apparatus comprising:

a support base having a generally curved contact surface to contact a supporting surface,



a headrest structure operatively associated with said support base including a mounting structure and a headrest, said headrest being constructed and arranged to receive and support a rear portion of a user's head,

a back shell structure carried by said mounting structure having an upper surface and an opposing lower surface, said upper surface including an expandable bladder structure constructed and arranged to contact a rear portion of a user's head which is not being supported by said headrest,

a front shell structure having a plurality of resilient fingers extending from a surface thereof, said fingers being constructed and arranged to contact certain facial tissue of the user,

connecting structure to secure said front shell structure to said back shell structure to accommodate a users head therebetween such that said front shell structure may move with respect to the user's face,

whereby when said front shell structure is secured to said back shell structure with the user's head therebetween, movement of said bladder structure 1) massages a rear portion of the user's head not being supported by said headrest, and 2) causes the user's head to move with respect to said fingers such that said fingers massage said certain facial tissue while the user's head remains in contact with said headrest,

wherein said mounting structure includes at least one spacer to couple said headrest to said support base so that said headrest is in spaced relation with respect to said support base.

6,039,705

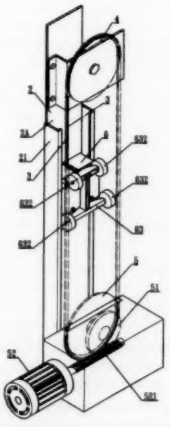
STRUCTURE OF A PAD TYPE ROLLER MASSAGER

Dong-Her Wu, No.141, Sec. 2, Chang Shui Road, Pu Yen Hsiang, Chang Hua Hsien, Taiwan

Filed Jul. 2, 1998, Appl. No. 108,781

Int. Cl.[7] A61H *15/00*

U.S. Cl. 601—99 **5 Claims**



1. An improved structure of a pad type roller massager, comprising:

a limiting frame body, being an elongated high-strength plate having a substantially inverted U-shaped cross section and including two opposed limiting side walls bending inwardly to define a longitudinal recess therebetween, a driven gear and a transmission gear being linked up by a chain and respectively disposed at tip and bottom ends of said limiting frame body, a section of said chain hanging vertically within said recess fo said limiting frame body, said transmission gear being provided with a co-axial driven gear to be screwably connected to a worm gear extended from a spindle of a drive motor so that said motor drives said driven gear of said transmission gear to thereby drive said chain to cyclically move; and

a roller mounting seat, including a seat body fitted into said recess fo said limiting frame body to a certain extent, and limiting bolts fitted with elastic sleeves being provided on both sides of said roller mounting seat and being fitted into both limiting side walls at both sides fo said recess fo said limiting frame body to be subjected to limitation of the vertical sliding displacement thereof, a transverse bolt being utilized to pivotally lock a vertical portion of a substantially T-shaped frame plate to a top side of said roller mounting seat such that said frame plate may displace within a very small angle which is adjustable, both ends of a horizontal portion of said frame plate having movable rollers pivotally mounted thereon a middle portion of the bottom side of said roller mounting seat being positioned on a middle position of said chain, whereby when said chain is driven by said transmission gear, said roller mounting seat will be brought to displace upwardly and downwardly therewith, said movable rollers being configured to project to the from to press against or roll along the back of a user to achieve massaging effects, said elastic sleeves being provided in said limiting frame body to absorb the shock during operation and maintain stability during displacement or movement of said roller mounting seat and said movable rollers.

6,039,706

MEDICAL SPLINT, METAL SHEET FOR SUCH A SPLINT AND ITS USE

Kalman Bolla, and Orsolya Bolla, both of Neuhausen am Rheinfall, Switzerland, assignors to Chrisofix AG, Schaffhausen, Switzerland

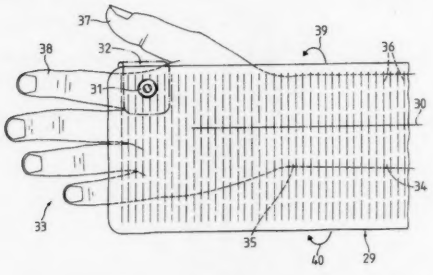
PCT No. PCT/CH96/00450, § 371 Date Aug. 5, 1998, § 102(e) Date Aug. 5, 1998, PCT Pub. No. WO97/22312, PCT Pub. Date Jun. 26, 1997

PCT Filed Dec. 19, 1996, Appl. No. 77,958

Claims priority, application Switzerland, Dec. 20, 1995, 3605/95; Aug. 8, 1996, 1950/96

Int. Cl.[7] A61F *5/00*

U.S. Cl. 602—5 **26 Claims**



1. A medical splint for securing and immobilizing movable body parts, in particular extremities, of a human or an animal along a splint axis, where said splint comprises a sheet metal or plate that is covered on both sides with a covering or a cover layer, characterized in that the sheet metal or the plate is designed so it is corrugated in at least some areas, where the peaks and valleys of the corrugations run essentially across the splint axis,

said splint having an additional reinforcement provided in predetermined areas of said splint, in the form of an inserted strip or plate of sheet metal.

6,039,707

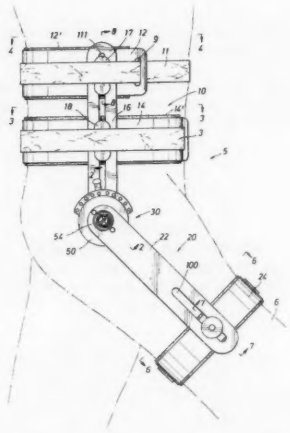
PELVIC SUPPORT AND WALKING ASSISTANCE DEVICE

Michael K. Crawford, 631 Knipp Rd., Houston, Tex. 77024, and James M. Killian, 10215 Sugar Hill, Houston, Tex. 77042

Filed Feb. 16, 1999, Appl. No. 251,010

Int. Cl.[7] A61F *5/00*

U.S. Cl. 602—5 **7 Claims**



1. A pelvic support and walking assistance device comprising,

a trunk support member arranged and designed to be removably secured about a torso of a user, said trunk support member including an upper connection plate,

a thigh linking member arranged and designed to be removably secured about a thigh of said user, said thigh support member including a lower connection plate,

a pivot joint coupled to said upper connection plate and to said lower connection plate and arranged and designed for placement at a side of a hip of said user at a position opposite a hip joint of a user, and

a resilient device coupled between said upper connection plate and said lower connection plate which applies forward torque to said lower connection plate when said user takes a step by raising said thigh,

wherein said trunk support member applies a reactive torque from said torso of said user.

6,039,708

FLEXIBLE CORD COLLAR HARNESS DEVICE

Michael J. Schaming, 82 Sands St., Staten Island, N.Y. 10304

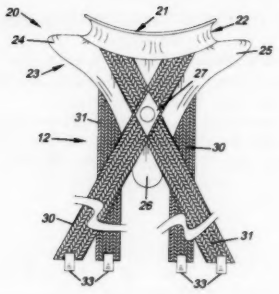
Filed Apr. 9, 1999, Appl. No. 288,561

Int. Cl.[7] A61F *5/00*

U.S. Cl. 602—18 **9 Claims**

1. A collar harness device to protect a user's neck and upper torso from frictional engagement with elongated flexible tubular items including pneumatic hoses and electrical cords wherein the device comprises:

a collar unit including a generally rigid cape member having a collar portion which surrounds the back and a portion of the sides of the user's neck; wherein, the collar portion defines an arcuate trough having an opening that is directed outwardly



from the users neck and dimensioned to receive a portion of a selected one of said elongated flexible tubular items.

6,039,709

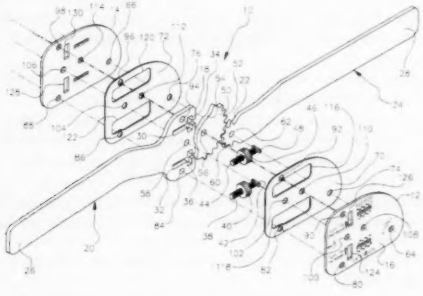
ORTHOPEDIC HINGE ASSEMBLY

Jan J. Bzoch, Treasure Island, Fla., assignor to Orthosis Corrective Systems, Pirellas Park, Fla.

Filed Dec. 16, 1998, Appl. No. 212,224

Int. Cl.[7] A61F *5/00*

U.S. Cl. 602—26 **16 Claims**



15. An orthopedic hinge assembly for use with an orthopedic device comprising:

(a) a top and bottom exterior plate with a first and second spaced apart slot on each top and bottom exterior plate, the first slot on the top exterior plate aligned with a first slot on the bottom exterior plate and the second slot on the top exterior plate aligned with a second slot on the bottom exterior plate;

(b) a first elongated bar having a first end portion attachable to the orthopedic device and having a second end portion containing means to support first and second thumb wheels, each thumb wheel threadably mounted on a screw, the first thumb wheel protruding through the first aligned slots in the top and bottom exterior plates and the second thumb wheel protruding through the second aligned slots in the top and bottom exterior plates;

(c) a second elongated bar having a first end portion adapted to be attached to the orthopedic device and having a second end portion terminated with a circular pattern of gear teeth;

(d) a cam gear juxtaposed to the second end portion of the first elongated bar engageable with the gear teeth of the second elongated bar;

(e) the second end portion of the first elongated bar, the second end portion of the second elongated bar and the cam gear enclosed by the top and bottom exterior plates; and

(f) the exterior plates having corresponding aligned holes through which rivets traverse to retain the hinge assembly together.

6,039,710

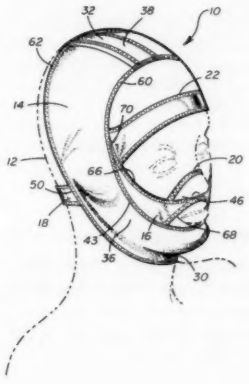
APPARATUS FOR PROVIDING FACIAL SUPPORT

David E. Kelley, Santa Monica; Jeffrey C. Kramer, Sherman Oaks; Jonathan L. Pontell, Beverly Hills; Loretta S. Parral, Studio City; Michelle V. Roth, Venice; Anoush Yergen, Studio City, and Arlene Sanford, Los Angeles, all of Calif., assignors to Twentieth Century Fox Film Corporation, Los Angeles, Calif.

Filed Sep. 29, 1997, Appl. No. 939,694

Int. Cl.[7] A61F *13/12*

U.S. Cl. 602—74 **17 Claims**



16. An apparatus for providing facial support, comprising:

a first band having a first portion, said first band configured to wrap around a human head and said first portion configured to be below a jaw of the human head, said first band being made of a soft stretchable material;

an elastic band separate from and attached to said first band;

a cheek support separate from and attached to said first band, said cheek support in combination with said first band is configured to cover and support at least a portion of both cheeks on the human head, said cheek support and said first band define an aperture for a mouth, said first band and said cheek support are attached at said elastic band; and

a first strap attached to said first band, said first strap designed to fit behind the human bead and cause said cheek support to apply a force to both cheeks on the human head.

6,039,711

SYSTEM FOR LIQUID SEPARATION

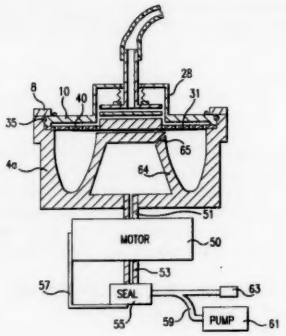
Thomas D. Headley, Wellesley, Mass., and Edward T. Powers, Hampton Falls, N.H., assignors to Transfusion Technologies Corporation, Natick, Mass.

Division of application No. 08/800,085, Feb. 12, 1997, which is a division of application No. 08/322,601, Oct. 13, 1994, Pat. No. 5,733,253. This application Nov. 20, 1998, Appl. No. 197,066.

Int. Cl.[7] A61M *37/00;* **B04B** *11/00*

U.S. Cl. 604—4 **31 Claims**

1. A centrifuge system for accepting a rotor having a rigid mounting member and an elastic diaphragm attached to the mounting member, the system comprising:



means for holding the rigid mounting member of the rotor and for spinning the rotor around an axis; and

means for changing the pressure of a control fluid adjacent the rotor's diaphragm.

6,039,712

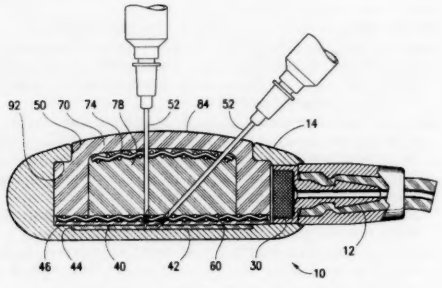
IMPLANTABLE INJECTION PORT

Terence M. Fogarty, 1830 River Ridge Rd., Hudson, Wis. 54016, and Robert A. Arp, Eden Prairie, Minn., assignors to Terence M. Fogarty, Hudson, Wis.

Filed Nov. 4, 1997, Appl. No. 964,473

Int. Cl.[7] A61M *11/00*

U.S. Cl. 604—93 **18 Claims**



1. A low profile implantable injection port for subcutaneous implantation into the body of a patient, comprising:

a generally cup-shaped housing having an open end;

a self-sealing septum mounted to said housing in the open end;

a low aspect ratio fluid channel within the housing below the septum;

a needle-penetrable, non-solid component in the fluid channel to form a low residual fluid-retaining volume within the fluid channel, the component having interconnected pathways for allowing fluid to move through the channel; and

a conduit connector connected to said housing and in fluid communication with said fluid channel for delivering medication from said channel to a patient when attached to a catheter.

6,039,713

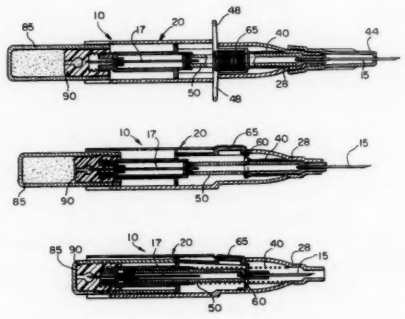
PRE-FILLED RETRACTABLE NEEDLE INJECTION DEVICE

Michael J. Botich, Oxnard; Thor R. Halseth, Simi Valley, and John Barker, Ventura, all of Calif., assignors to MDC Investment Holdings, Inc., Wilmington, Del.

Provisional application No. 60/078,233, Mar. 17, 1998, Provisional application No. 60/058,004, Aug. 28, 1997. This application Aug. 26, 1998, Appl. No. 139,540.

Int. Cl.[7] A61M *5/00*

U.S. Cl. 604—110 **21 Claims**



1. An injection device for use with a pre-filled medication cartridge of the type containing a supply of medication and having a puncturable piston positioned at a forward end therein, the device comprising:

a barrel sized to receive the cartridge and having a forward portion including a bore of a reduced diameter;

a first needle positioned axially within the reduced diameter portion and extending out of the forward portion of the barrel;

a spring positioned in the barrel for exerting a rearward bias on the needle;

a needle retainer positioned in the barrel for retaining the needle within the bore against the rearward bias exerted by the spring;

a second needle in fluid communication with the medication in the cartridge;

a conduit extending between the first needle and the second needle;

an actuator operable to release the needle from the needle retainer;

wherein the spring propels the conduit and the first needle rearwardly upon release of the needle from the needle retainer so that the conduit telescopingly engages the second needle.

6,039,714

COLLAPSIBLE RETENTION BOLSTER FOR GASTROSTOMY AND OTHER OSTOMY TUBES

Raymond F. Cracauer, Plymouth, and Lester D. Michels, Eden Prairie, both of Minn., assignors to Novartis Nutrition AG, Berne, Switzerland

Filed May 12, 1998, Appl. No. 76,443

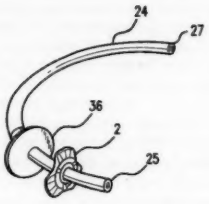
Int. Cl.[7] A61M *5/32;11/00*

U.S. Cl. 604—174 **26 Claims**

1. A collapsible retention bolster for securing an ostomy tube to the inner wall of a body cavity lining of a patient comprising:

a. a central circular base extending outwardly from a central bore with two or more radially disposed, spaced grooves cut therein; and

b. two or more flexible flanges that are grooved along their central axis and extend outwardly from said base portion



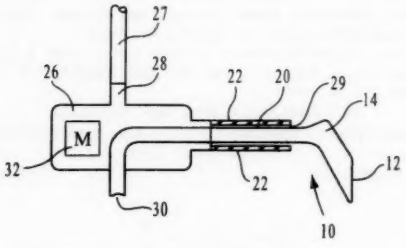
spaced about the periphery thereof and from between the grooves in said base.

6,039,715

ANGULATED PHACOEMULSIFICATION NEEDLE WHOSE OUTER SURFACE CONVERGES AND INNER CHANNEL NARROWS

Richard J. Mackool, 31-27 41st St., Astoria, N.Y. 11103

Filed May 11, 1998, Appl. No. 75,615
Int. Cl.[7] A61M *5/32*
U.S. Cl. 604—272 **15 Claims**



1. A phacoemulsification apparatus comprising:

an elongated, hollow needle body having an evacuation port, a straight portion, and an angulated portion between said evacuation port and said straight portion, said angulated portion changing an angular orientation of said body with respect to said straight portion, said body having an elongated channel that defines said hollow of said body, said body defining said elongated channel to narrow diametrically as the elongated channel extends in a direction toward said straight portion before, at or beyond said angulated portion, said body having an elongated exterior configured to narrow diametrically as the elongated exterior extends in a direction toward said straight portion before, at, or beyond said angulated portion, both said elongated channel and said elongated exterior narrowing in diameter in a direction away from said evacuation port between said straight portion and said angulated portion.

6,039,716

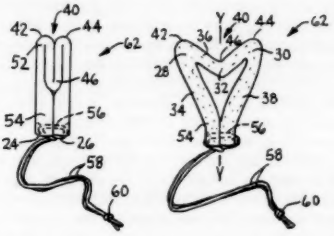
LATERALLY EXPANDABLE TAMPON

James Lyle Jessup, Appleton, and Donald Henry Paalman, Kaukauna, both of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation-in-part of application No. 08/695,494, Aug. 12, 1996, abandoned, and a continuation-in-part of application No. 08/700,599, Aug. 12, 1996, Pat. No. 5,659,934. This application Feb. 27, 1998, Appl. No. 32,232.
Int. Cl.[7] A61F *13/15*
U.S. Cl. 604—385.1 **20 Claims**

15. A tampon comprising:

a) an absorbent having a generally circular cross-sectional configuration;



b) a liquid-permeable cover circumferentially surrounding said absorbent to form an elongated softwind having a first end and a second end, said softwind being folded upon itself at three spaced apart locations to form an M-shaped profile, said softwind being compressed into a cylindrically shaped pledget having an insertion end and a trailing end with said insertion end containing a greater amount of absorbent than said trailing end, said insertion end having a cleft formed therein which is capable of laterally expanding immediately upon insertion into a woman's vagina; and

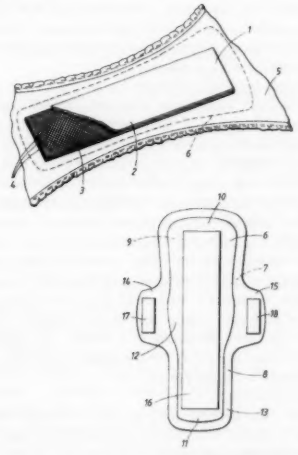
c) a withdrawal string attached to said trailing end of said pledget and passing through an aperture formed through both said absorbent and said cover and securing said first end in direct contact to said second end to form said trailing end of said pledget to restrict expansion of said trailing end of said pledget.

6,039,717

ADHESIVE FASTENING DEVICE

Björn Larsson, Örsviksvägen, Sweden, assignor to SCA Hygiene Products AB, Goteborg, Sweden

PCT No. PCT/SE96/00946, § 371 Date Jan. 23, 1998, § 102(e) Date Feb. 2, 1998, PCT Pub. No. WO97/05842, PCT Pub. Date Feb. 20, 1997
PCT Filed Jul. 12, 1996, Appl. No. 248
Claims priority, application Sweden, Aug. 3, 1995, 9502747
Int. Cl.[7] A61F *13/15*
U.S. Cl. 604—391 **8 Claims**



1. A fastening device for removeable fastening on textile or textile-like material surfaces, comprising a self-adhesive, pressure sensitive adhesive layer with a first surface intended to be permanently joined to a substrate and a second surface intended to serve as a fastening surface onto the textile or textile-like material surface, wherein a non-adhesive covering layer having a thickness which does not exceed 0.5 mm and having a plurality of penetrat-

ing openings or pores arranged essentially perpendicularly to the plane of the covering layer is arranged on and affixed to the fastening surface of the adhesive layer and wherein the distance between two adjacent openings or pores in the covering layer does not exceed 3 mm, wherein the covering layer comprises an essentially incompressible nonwoven material or net material being made of relatively coarse threads or fibres in the order of 5–10 dtex and having a surface weight between 7 g/m^2 and 20 g/m^2, wherein the relation between the dimension of the openings or pores in the covering layer and the coarseness of the fibers is such that the fastening device exhibits adhesion onto textile or textile-like material surfaces, but essentially no adhesion onto smooth material surfaces.

6,039,718

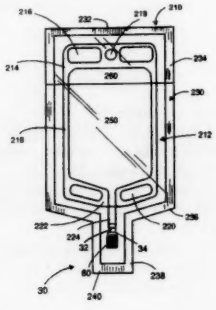
MULTIPLE USE UNIVERSAL CONNECTOR

John J. Niedospial, Jr., Burlington, N.J., assignor to Bracco Research USA, Princeton, N.J.

Continuation-in-part of application No. 09/119,470, Jul. 20, 1998, which is a continuation-in-part of application No. 09/009,487, Jan. 20, 1998. This application Feb. 9, 1999, Appl. No. 246,798.

Int. Cl.^{7} A61B *19/00*

U.S. Cl. 604—408 **20 Claims**



1. A multiple use universal connector and flexible medical container assembly containing a light-sensitive medical fluid therein packaged in an overwrap to prevent degradation of said light-sensitive medical fluid wherein:

(a) said flexible medical container comprises:

first and second transparent polymeric sheets superimposed and sealed together at their periphery defining an interior reservoir for the containment of said light-sensitive medical fluid, said flexible medical container having an inside wall, an outside wall, a top portion and a bottom portion;

an access port located at the bottom portion sealed between said first and second transparent polymeric sheets;

(b) a multiple use universal connector sealed into said access port, said multiple use universal connector comprising:

(1) a connector body of tube-like configuration having a distal end and a proximal end, said distal end being slideably inserted into said access port of said flexible medical container and said proximal end sealing the light-sensitive medical fluid in said flexible medical container by an

(2) elastomeric diaphragm and a

(3) removable cap;

(4) a first cap-locking ring on the proximal end of said connector body which serves as a male thread to receive said removable cap; and

(5) a second cap-locking ring, spaced from said first cap-locking ring towards the distal end of said connector body, which serves as stopping means for the removable cap when the removable cap is threaded onto the connector body;

said elastomeric diaphragm is of M-shaped configuration, capable of flexing under pressure sealing said proximal end of said connector body, and being capable of re-sealing itself after being pierced by an external access means; and

said removable cap being threaded onto the proximal end of said connector body to protect said elastomeric diaphragm from environmental forces to maintain said diaphragam in aseptic condition prior to removal of said removable cap for accessing the light-sensitive medical fluid of the flexible medical container or transferring a light-sensitive medical fluid to said flexible medical container by an external access means;

said flexible medical container and said multiple use universal connector assembly being enclosed in an overwrap,

(c) said overwrap comprises:

first and second tarnapartent UV rays barrier polymeric sheets with an inside wall and an outside wall having a square, round oval, hexagonal, octagonal or rectangualr configuration superimposed and sealed together at their periphery hermetically sealing said flexible medical container and said universal connector assembly preventing penetration of UV rays into the light-sensitive medical fluid container in said flexible medical container.

6,039,719

BAG FOR CONTAINING A STERILE MEDICAL SOLUTION AND METHOD OF MIXING A STERILE MEDICAL SOLUTION

Anders Wieslander, Lund, Sweden, and Giorgio Cappelli, Genoa, Italy, assignors to Gambro AB, Sweden

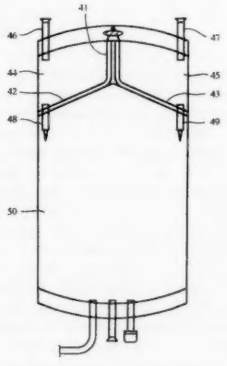
PCT No. PCT/SE96/00989, § 371 Date Feb. 6, 1998, § 102(e) Date Feb. 6, 1998, PCT Pub. No. WO97/05852, PCT Pub. Date Feb. 20, 1997

PCT Filed Aug. 6, 1996, Appl. No. 11,411

Claims priority, application Sweden, Aug. 8, 1995, 9502769

Int. Cl.^{7} A61B *19/00*

U.S. Cl. 604—410 **12 Claims**



1. A container for sterile medical solutions including glucose, said container comprising a front side, a back side, a top border and a bottom border, separation means joining said front and back sides of said container so as to create at least first, second and third compartments within said container, said first compartment hang a sufficient size to accommodate said sterile medical solution including glucose and including an electrolyte solution, said second and third compartments including high concentration glucose solutions, a first openable connector for selectively connecting said first and second compartments upon opening said first openable connector in order to mix said glucose solution in said second compartment with said electrolyte solution in said first compartment, and a second openable connector for selectively connecting said first and third compartments upon opening said second openable connector in order to mix said glucose solution in said third compartment with said electrolyte in said first compartment, whereby a sterile medical solution including glucose can be produced in said first

compartment with the least three different selected concentrations of said glucose therein.

6,039,720

BAG FOR CONTAINING A STERILE MEDICAL SOLUTION

Anders Wieslander, Lund, Sweden, assignor to Gambro AB, Sweden

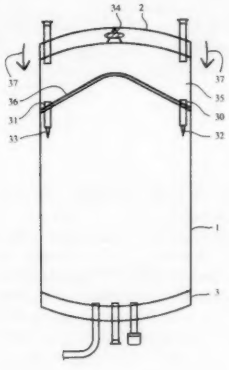
PCT No. PCT/SE96/00984, § 371 Date Feb. 6, 1998, § 102(e) Date Feb. 6, 1998, PCT Pub. No. WO97/05851, PCT Pub. Date Feb. 20, 1997

PCT Filed Aug. 2, 1996, Appl. No. 11,412

Claims priority, application Sweden, Aug. 8, 1995, 9502768

Int. Cl.[7] A61B *19/00*

U.S. Cl. 604—410 **12 Claims**



1. A container for sterile medical solutions, said container comprising an upper surface, a lower surface, a relatively rigid top border, including a central portion and peripheral portions surrounding said central portion, a relatively rigid bottom border, at least one separation line joining said upper and lower surfaces of said container so as to create first and second compartments within said container, said top border including an aperture for supporting said container in a first position wherein said first compartment is disposed below said second compartment, and at least one openable connector for selectively connecting said first and second compartments upon opening said openable connector in order to mix the contents of said first and second compartments, said top border including lines of weakness in said central portion in order to form a hinged connection between said peripheral portions of said top border upon said mixing of said contents of said first and second compartments.

6,039,721

METHOD AND CATHETER SYSTEM FOR DELIVERING MEDICATION WITH AN EVERTING BALLOON CATHETER

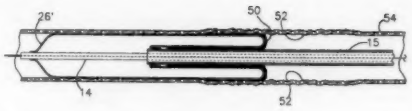
Kirk Johnson, Miami Lakes, Fla., and Merril L. Knudtson, Calgary, Canada, assignors to Cordis Corporation, Miami, Fla.

Division of application No. 08/686,163, Jul. 24, 1996, abandoned. This application Dec. 3, 1997, Appl. No. 984,576.

Int. Cl.[7] A61M *31/00*

U.S. Cl. 604—508 **2 Claims**

1. A process of applying a medication to a diseased portion of a blood vessel with a catheter having a balloon connected to distal ends of inner and outer tubes, comprising:



providing a balloon catheter having an inner and outer tube which are longitudinally adjustable with respect to each other, and a balloon affixed at opposing ends of the balloon to a distal end of one of the inner and outer tubes; the balloon defining a medication portion, and a lumen being defined between the inner and outer tubes;

applying a coating of medication to the medication portion of a surface of the balloon;

positioning distal ends of the inner and outer tubes in closely spaced relationship and folding the balloon on itself such that the balloon assumes an annular everted shape defining inner and outer balloon layers, wherein the entire balloon surrounds some portion of one of the inner and outer tubes; the medication portion of the balloon being arranged on the inner layer which is internal, and the balloon having a shielding portion of the balloon on the outer layer which surrounds the remainder of the balloon;

inserting the catheter into the vessel and positioning the balloon adjacent the diseased portion of the blood vessel;

inflating the balloon by delivering fluid through the lumen defined between the tubes and communicating with the balloon;

continuing the inflation until the shielding portion engages the vessel adjacent the diseased portion;

longitudinally adjusting the inner and outer tubes relatively to unfold the balloon as the inflation continues, thereby bringing the medication portion into contact with the diseased portion of the blood vessel, to apply the medication to the diseased portion; and

deflating the balloon and removing the catheter from the vessel.

6,039,722

DEVICE FOR SECURING THE ENDS OF CATHETER GUIDE WIRES

Michael Greive, Kirchstrasse 4, D-48308 Ottmarsbocholt, Germany

Continuation of application No. 08/525,754, filed as application No. PCT/EP94/04054, Dec. 6, 1994, abandoned. This application Aug. 20, 1998, Appl. No. 137,897.

Claims priority, application Germany, Dec. 23, 1993, 93 19 838 U

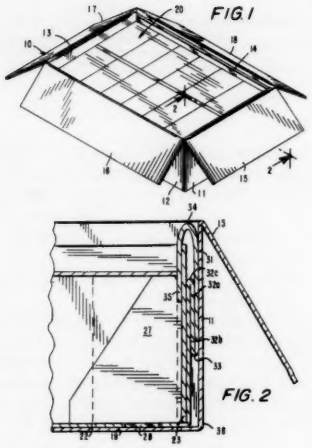
Int. Cl.[7] A61M *25/00*

U.S. Cl. 604—528 **5 Claims**

1. An apparatus for straightening the end of a catheter guide wire, said apparatus comprising;

an elongate tube for storing a catheter guide wire, said tube having end;

an elongate hollow element open at both ends, said element including a cylindrical section dimensioned to receive said end of said tube, and a conical section which tapers in a direction away from said cylindrical section, a U-shaped slit in the wall of said hollow elongate element and extending in the longitudinal direction of said hollow element and defining a first edge, the legs of said U-shaped slit defining a flexible tongue having two ends, said tongue secured at a first end to said wall, the second end of said tongue is free, at least a portion of said tongue depressable into said hollow element, substantially parallel to the longitudinal direction of said elongate hollow element, said at least a portion of said tongue



received in said end of said tube, whereby said tongue engages a catheter guide wire stored in said tube to prevent displacement of said catheter guide wire in said longitudinal direction.

6,039,723

CATHETER

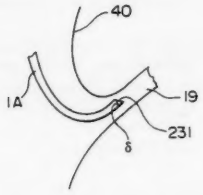
Junichi Tanaka, Angyouhara 930-32, Kawaguchi-shi, Saitama; Kunio Miyoshi, 10-18, Koushien 3-bancho, Nishinomita-shi, Hyougo, and Sensuke Yamashita, 10-4, Kitarokkoudai 3-chome, Nishinomiya-shi, Hyougo, all of Japan, assignors to Junichi Tanaka, Kawaguchi; Kunio Miyoshi, and Sensuke Yamashita, both of Nishinomiya, all of Japan

Filed Nov. 12, 1997, Appl. No. 969,014

Claims priority, application Japan, Nov. 12, 1996, 8-300578; Oct. 14, 1997, 9-280682

Int. Cl.[7] A61M *25/00*

U.S. Cl. 604—532 **15 Claims**



1. A coronary artery angiographic and percutaneous transluminal coronary angioplasty guiding catheter, comprising:

a substantially tubular distal top portion having an open distal end;

a substantially tubular proximal main portion; and

a substantially tubular bend portion connectively provided between said distal top portion and said proximal main portion,

wherein at the distal end of said distal top portion an inclined portion is formed, the inclined portion being inclined such that a length of said distal top portion is shorter on an inside periphery of said bend portion than on an outside periphery of said bend portion and wherein the inclined portion comprises a closed portion being bent and sealed.

6,039,724

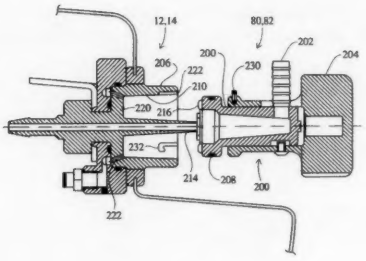
MEDICAL AND BIOLOGICAL FLUID COLLECTION AND DISPOSAL SYSTEM

Raymond C. Seifert, Chardon, and John R. Bradbury, Strongsville, both of Ohio, assignors to Steris Corporation, Mentor, Ohio

Division of application No. 08/571,533, Dec. 13, 1995, Pat. No. 5,776,118. This application Apr. 20, 1998, Appl. No. 62,909. This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61M *25/00*

U.S. Cl. 604—533 **5 Claims**



1. A self-disinfecting fitting assembly comprising:

an inlet fitting including:

a tubular member for frictionally receiving tubing along an outer surface thereof, the tubing member having an internal passage for receiving fluids from the tubing,

an outer peripheral wall surrounding the tubular member,

a base wall interconnecting the peripheral wall and the tubular member to define a well around the tubular member,

a drain outlet extending from a region adjacent an intersection of the peripheral and base walls;

an outer covering member including:

a housing member having a peripheral edge which frictionally engages the inlet fitting peripheral wall in a fluid tight seal,

a plurality of projections for holding the housing member offset from the inlet fitting base wall and defining a fluid passage in fluid communication with the drain outlet,

the housing member defining an internal chamber which surrounds the tubular member in a spaced relationship thereto, and

a fluid inlet into the housing member internal chamber for receiving a disinfectant fluid.

6,039,725

APPARATUS AND METHOD FOR SECURING A MEDICAL INSTRUMENT TO A CANNULA OF A TROCAR ASSEMBLY

Stephen P. Moenning, 124 Hibiscus, Punta Gorda, Fla. 33950, and Charles Manker, 35 N. Greenbay Rd., Lake Forest, Ill. 60045

Division of application No. 08/840,668, Apr. 29, 1997. This application Nov. 3, 1998, Appl. No. 185,335.

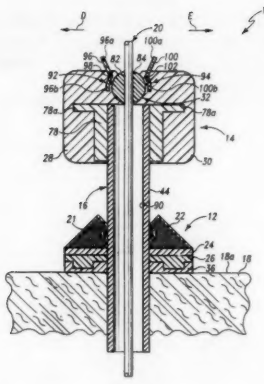
Int. Cl.[7] A61M *25/00*

U.S. Cl. 606—1 **8 Claims**

1. A method for securing a medical instrument to a cannula of a trocar assembly, wherein said cannula defines a cannula passageway extending therethrough, comprising the steps of:

attaching an instrument retainer to said cannula, said instrument retainer including an instrument holder (1) having a passageway extending therethrough and (2) being rotatable secured to said instrument retainer,

inserting said instrument through said passageway, and



rotating said instrument holder relative to said instrument retainer so that said passageway of said instrument holder tilts relative to said cannula passageway.

6,039,726

METHOD AND APPARATUS FOR CONCENTRATING LASER BEAMS

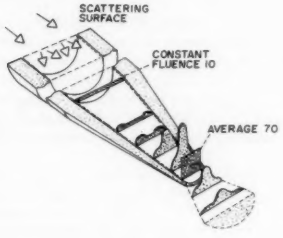
Aaron Lewis; Daniel Palanker, and Igor Turovets, all of Jerusalem, Israel, assignors to Nanoptics, Inc., Jerusalem, Israel

PCT No. PCT/US95/00540, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996, PCT Pub. No. WO95/19811, PCT Pub. Date Jul. 27, 1995

PCT Filed Jan. 23, 1995, Appl. No. 676,223

Int. Cl.[7] A61N *5/06*

U.S. Cl. 606—3 **11 Claims**



1. A device for delivery of an ArF excimer laser beam for microsurgery, comprising:

an elongated, fused silica optical fiber having a conical end portion having an inlet end with a first diameter and an outlet end with a second diameter, said fiber having an energy fluence threshold at which laser light from an excimer laser tends to damage the fiber;

an exit aperture at said outlet end, said exit aperture having a diameter which is smaller than the diameter of said inlet end, said conical portion of said fiber serving as an energy fluence concentrator for an excimer laser beam supplied to said inlet end;

a scattering surface in said fiber prior to said inlet end of said conical portion for scattering the laser beam supplied to the inlet end to increase the divergence of, and to produce peak energy broadening in, the laser beam supplied to said concentrator, the scattering surface being selected to maximize the energy fluence of the exit beam while maintaining an energy fluence level within the tapered portion which is below said threshold; and

said conical portion being tapered inwardly from its inlet end to its outlet end to concentrate the laser beam to permit an increase in energy fluence at the exit aperture which is sufficient to permit ablation of materials in soft tissue microsurgery by the exit beam.

6,039,727

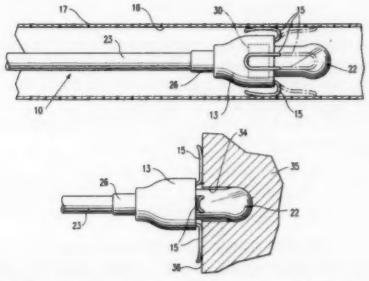
CHANNEL FORMING DEVICE WITH PENETRATION LIMITER

Manuel A. Javier, Jr., Santa Clara; Stephen B. Pearce, Fremont; Randy J. Kesten, Mountain View; Sam G. Payne, Santa Clara, and Kevin Gertner, Campbell, all of Calif., assignors to Cardiogenesis Corporation, Santa Clara, Calif.

Continuation-in-part of application No. 08/482,125, Jun. 7, 1995. This application Jan. 11, 1996, Appl. No. 584,957.

Int. Cl.[7] A61N *5/06*

U.S. Cl. 606—10 **21 Claims**



1. A device for forming a channel into a ventricular wall of a patient's heart comprising:

a) an elongated shaft having a proximal shaft section, a distal shaft section and a distal end;

b) at least one optical probe member disposed on the distal end of the shaft which has a proximal end, a distal end, and an energy emitting surface disposed on the distal end, said energy emitting surface configured for engaging the ventricular wall of the patient's heart, emitting laser energy, forming a channel therein, and mechanically penetrating said channel; and

c) at least one radially expandable member secured to the optical probe member having a penetration limiting surface when in an unconstricted state, the entire penetration limiting surface being spaced proximally from the energy emitting surface of the optical probe member and the penetration limiting surface being configured to limit penetration of the energy emitting surface of the optical probe member into the ventricular wall during formation of the channel therein to a distance substantially equal to a distance between the energy emitting surface and the penetration limiting surface.

6,039,728

WORKING SHAFT FOR PHOTO-THERMAL THERAPY

Hans-Peter Berlien; Gerhard Muller; Jürgen Beuthan, and Carsten Philipp, all of Berlin, Germany, assignors to Ceram Optec GmbH, Bonn, and Huttinger Medizintechnik GmbH, Umkirch, both of Germany

PCT No. PCT/DE93/00321, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO93/19680, PCT Pub. Date Oct. 14, 1993

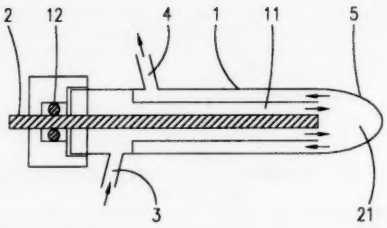
PCT Filed Apr. 2, 1993, Appl. No. 313,256

Claims priority, application Germany, Apr. 6, 1992, 42 11 526; Oct. 30, 1992, 42 37 286

Int. Cl.[7] A61B *17/36*

U.S. Cl. 606—15 **28 Claims**

1. An optical working shaft system for photo-thermal therapy comprising a working shaft for insertion into a working tube of at



least one of an endoscope and a catheter, the working shaft having a distal end defining a distal area in the vicinity thereof, the working shaft further comprising:

means for radiating, in a controlled manner, optical beams through the distal end;

an optical dome disposed at the distal end, being transparent to active components of the optical beams;

a fluid for scattering the beams contained at least in the distal end of said dome and for removing waste heat generated by a scattering of the beams, the fluid being associated with the means for radiating such that, at least in the distal area, a path of beams extends inside the fluid; and

wherein said fluid for scattering and for removing waste heat has multi-phases to effect the scattering.

6,039,729

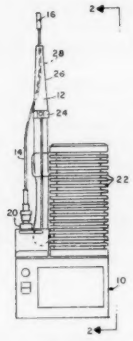
PORTABLE CAUTERY SYSTEM

Frederick M. Durville, Chelmsford; Raymond J Connolly, Pembroke; John C Lantis, Somerville; Robert H Rediker, Watertown, and Steven D. Schwaitzberg, Canton, all of Mass., assignors to Cynosure, Inc., and N. E. Medical Center Hospitals, both of Mass.

Filed Aug. 8, 1997, Appl. No. 910,949

Int. Cl.[7] A61B *17/32*

U.S. Cl. 606—16 **14 Claims**



1. A thermo-coagulator system for the coagulation of body tissue to avoid direct delivery of optical energy to said body tissue, comprising:

a medical instrument having a pair of biasable fingers, each of said fingers having a distal end with a metal tip secured thereon, at least one of said tips having a bore therein, said bore having an open end and an optical energy enclosing closed end;

an optical conduit having a distal end arranged within said bore in said metal tip, said distal end of said optical conduit facing said closed end of said bore; and

a source of optical energy coupled to said optical conduit to provide actuatable heat so as to raise the temperature of said metal tip on at least one of said fingers to permit said forceps to coagulate tissue.

6,039,730

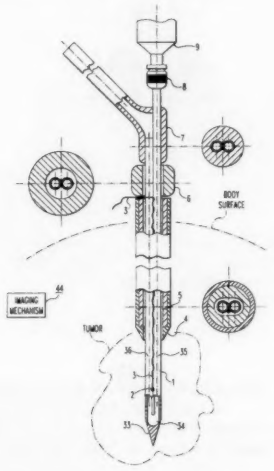
METHOD AND APPARATUS FOR CRYOSURGERY

Yoed Rabin; Thomas Benjamin Julian, and Norman Wolmark, all of Pittsburgh, Pa., assignors to Allegheny-Singer Research Institute, Pittsburgh, Pa.

Filed Jun. 24, 1996, Appl. No. 668,692

Int. Cl.[7] A61B *17/36*

U.S. Cl. 606—23 **20 Claims**



1. An apparatus for cryosurgery comprising:

a cryoneedle having an external surface, a tip at a first end, the cryoneedle has an inlet tube through which cryofluid flows during application of the cryoneedle to the tip and an outlet tube through which cryofluid flows during application of the cryoneedle from the tip; and

a thermal insulation shell disposed about a portion of the external surface of the cryoneedle for reduction of heat transfer from surrounding tissues of a body of a patient or freezing prevention of surrounding tissues of the body of the patient during application of the cryoneedle with the shell, said cryoneedle and shell configured for contact with the body of the patient, said shell about the portion of the external surface of the cryoneedle having an outer diameter of less than 3.2 mm.

6,039,731

APPARATUS AND METHOD FOR DETERMINING THE EXTENT OF ABLATION

Junius E. Taylor, Phoenix, and Loren C. Acker, Tucson, both of Ariz., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.

Continuation of application No. 08/851,879, May 6, 1997, Pat. No. 5,868,737, which is a continuation-in-part of application No. 08/488,887, Jun. 9, 1995, Pat. No. 5,697,925, Provisional application No. 60/016,647, May 15, 1996. This application Oct. 29, 1998, Appl. No. 182,712.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *17/39*

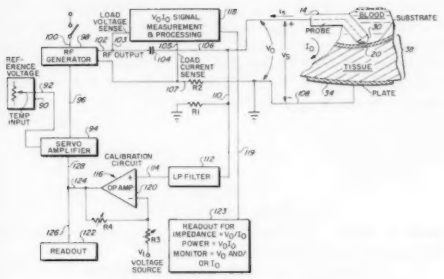
U.S. Cl. 606—34 **8 Claims**

1. Apparatus for sensing ablation of tissue at an ablation site during a tissue ablation procedure, said apparatus comprising in combination:

(a) a catheter having a tip for irradiating the ablation site with RF energy to perform the ablation procedure;

(b) a source of RF energy for transmitting RF energy to said tip;

(c) an electrode adapted to be adjacent tissue;



(d) a galvanic cell formed by said tip, said electrode and the tissue for generating a unique electrical signal responsive to ablation of the tissue at the ablation site; and

(e) a control circuit responsive to the unique electrical signal for controlling the RF energy transmitted to said tip.

6,039,732

ELECTRIC OPERATION APPARATUS

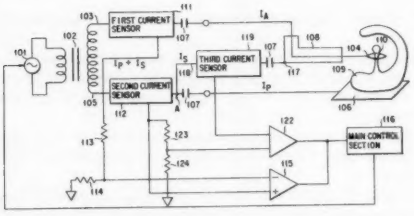
Yoshito Ichikawa, Saitama-ken; Takashi Mihori, Hachioji; Tomohisa Sakurai, Sagamihara, and Yoshitaka Honda, Tokorozawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1996, Appl. No. 631,272

Claims priority, application Japan, Apr. 18, 1995, 7-092706; May 1, 1995, 7-107508; May 24, 1995, 7-125148; May 16, 1995, 7-117521

Int. Cl.[7] A61B *17/36*

U.S. Cl. 606—38 **4 Claims**



1. An electric operation apparatus for performing a high frequency treatment on organic tissue, comprising:

selection means for selecting one of a plurality of high frequency output modes, said plurality of high frequency output modes including a spray coagulation mode in which a high releasing voltage is generated so that a breakdown is induced in air to thereby cause arc discharging at an output end, and so that a coagulation effect is generated by a high frequency current which flows when the arc discharging occurs, even though the organic tissue being treated is not in contact with an active electrode;

high frequency generator means, including a waveform generator section for generating waveforms corresponding to respective modes of the plurality of high frequency output modes, for outputting high frequencies corresponding to respective waveforms;

control means for controlling the high frequency generator means in accordance with selection operations performed by the selection means;

an active line connected to the high frequency generator means and including an active electrode;

a counter plate line connected to the high frequency generator means and including a counter plate; and

monitor means for detecting a current value of the high frequency current which flows between the active line and the counter plate line when the spray coagulation mode is selected by the selection means, and for inputting the current value into the control means;

wherein said control means further comprises:

means for holding in advance a threshold value at which the arc discharging is generated at the output end;

means for comparing the current value input by the monitor means and the threshold value, when the spray coagulation mode is selected by the selection means;

means for determining whether arc discharging has occurred at the output end, based on a result of the comparison; and

means for (i) controlling the high frequency generator means to continuously output a waveform corresponding to the spray coagulation mode generated by the waveform generator section if arc discharging at the output end is detected based on the result of the comparison, and (ii) controlling the high frequency generator means to intermittently output at a predetermined cycle a waveform corresponding to the spray coagulation mode generated by the waveform generator section if arc discharging at the output end is not detected based on the result of the comparison.

6,039,733

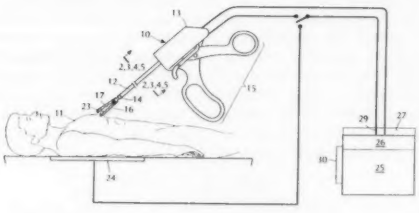
METHOD OF VASCULAR TISSUE SEALING PRESSURE CONTROL

Steven P. Buysse, Longmont; Jenifer S. Kennedy, Boulder; Michael J. Lands, Louisville; Donald R. Loeffler, Longmont; S. Wade Lukianow, Boulder, and Thomas P. Ryan, Fort Collins, all of Colo., assignors to Valleylab, Inc., Boulder, Colo.

Division of application No. 08/530,450, Sep. 19, 1995, Pat. No. 5,776,130. This application Jun. 25, 1998, Appl. No. 104,728.

Int. Cl.[7] A61B *17/36*

U.S. Cl. 606—40 **20 Claims**



1. A method for surgically clamping and sealing tissue, comprising the steps of:

providing an instrument comprising:

an elongated support having a user end and a patient end;

an actuator for operation by a user;

a pair of end effectors proximal to said patient end wherein at least one of said pair of end effectors is attached to said actuator to control the relative motion between said pair of effectors;

a lost motion connection between at least one of said pair of end effectors and said actuator;

an active electrode disposed on one of said pair of end effectors;

a return electrode adapted for contact with the tissue and which completes an electrical circuit between said active and return electrodes;

an electrosurgical energy supply for transmitting electrosurgical energy through said electrical circuit and across said active and return electrodes when the tissue is clamped between said pair of end effectors; and

a control associated with said electrosurgical energy supply to regulate an amount of electrosurgical energy to the tissue in response to the application of the predetermined clamping force;

positioning the tissue between said pair of end effectors;

transferring user manipulation of said actuator to at least one of said pairs of end effectors through said lost motion connection so as to maintain a predetermined clamping force irrespective of the user manipulation during sealing of the tissue between said pair of end effectors;

maintaining a predetermined clamping force during sealing of the tissue between said pair of end effectors; and

applying electrosurgical energy for sealing the held tissue in response to the application of the predetermined clamping force to the tissue between said pair of effectors.

6,039,734

ELECTROSURGICAL HAND-HELD BATTERY-OPERATED INSTRUMENT

Colin Charles Owen Goble, South Glamorgan, United Kingdom, assignor to Gyrus Medical Limited, Cardiff, United Kingdom

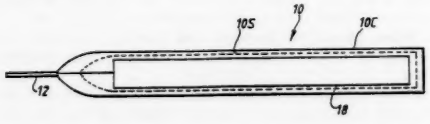
PCT No. PCT/GB96/02577, § 371 Date Jul. 27, 1998, § 102(e) Date Jul. 27, 1998, PCT Pub. No. WO97/15237, PCT Pub. Date May 1, 1997

PCT Filed Oct. 21, 1996, Appl. No. 65,091

Claims priority, application United Kingdom, Oct. 24, 1995, 9521772

Int. Cl.[7] A61B *17/39*

U.S. Cl. 606—41 **23 Claims**



1. An electrosurgical instrument comprising a handpiece, a monopolar electrode unit having a single treatment electrode projecting from the handpiece, and a radio-frequency generator within the handpiece, the handpiece including an electrically conductive shield around the generator as a capacitive coupling element between the generator and the surroundings, and wherein the generator has no radio-frequency connections other than a single radio-frequency output connection to the treatment electrode for providing an active output connection between the generator and a patient and, in use, a return path between the generator and the patient provided by said capacitive coupling.

6,039,735

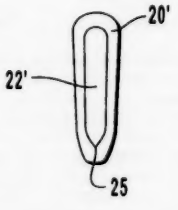
ELECTRIC FIELD CONCENTRATED ELECTROSURGICAL ELECTRODE

Darcy W. Greep, South Jordan, Utah, assignor to MegaDyne Medical Products, Inc., Draper, Utah

Filed Oct. 3, 1997, Appl. No. 943,551

Int. Cl.[7] A61B *17/39*

U.S. Cl. 606—45 **18 Claims**



1. An electrosurgical electrode member comprising a conducting electrode having a main body adapted for communicating radio frequency electrical energy to patient tissue for performing operative procedures thereupon, an insulating coating covering said main body, and energy concentration means including a working edge having an edge thickness of about 0.2 mm or less for concentrating electrical energy transferred across said insulating coating from said body to said patient tissue.

6,039,736

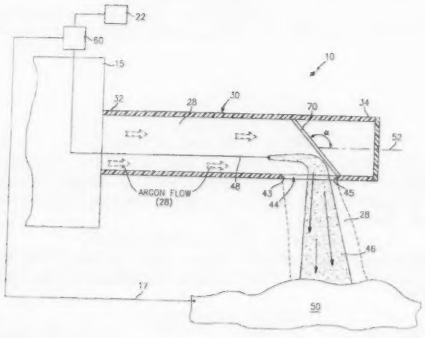
SIDE-FIRE COAGULATOR

Robert C. Platt, Jr., Boulder, Colo., assignor to Sherwood Services AG, Schaffhausen, Switzerland

Filed Sep. 29, 1998, Appl. No. 162,796

Int. Cl.[7] A61B *17/39*

U.S. Cl. 606—49 **11 Claims**



1. An electrosurgical apparatus for coagulating tissue, comprising:

an elongated flexible tube having a proximal end and a distal end, said tube comprising at least one aperture located along the periphery of said tube between said proximal and distal ends;

a source for supplying pressurized ionizable gas at a rate of greater than 1 liter per minute to said proximal end of said tube;

an angularly disposed surface located within said tube proximate said aperture for redirecting pressurized ionizable gas through said aperture at said tissue; and

at least one electrode for ionizing pressurized ionizable gas prior to pressurized ionizable gas exiting said aperture.

6,039,737

OPERATION OF A VERTEBRAL AXIAL DECOMPRESSION TABLE

Allan E. Dyer, 1400 Dixie Road, Mississauga, Canada, L5M 3B1

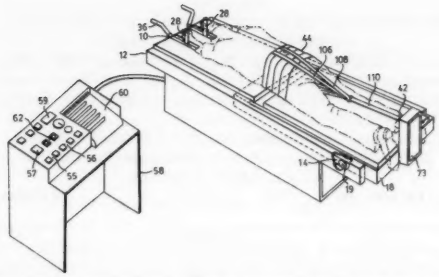
Filed Oct. 29, 1998, Appl. No. 182,250

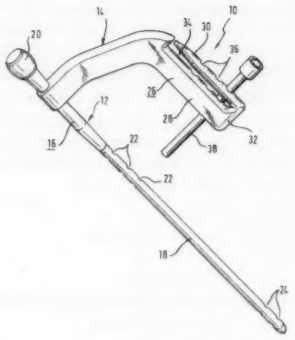
Claims priority, application Australia, Aug. 12, 1998, 79929/98

Int. Cl.[7] A61B *17/56*

U.S. Cl. 606—58 **23 Claims**

23. A method of operating a vertebral axial decompression table to yield an automated repetition of cycles, comprising the steps of increasing a separating force from a baseline separating force to an initial force of up to 50% of a maximum separating force above the baseline separating force, increasing said separating force approximately logarithmically from about 50% of said maximum separating force above the baseline separating force to said maximum separating force, decreasing said separating force approximately according to a linear function of time back to the baseline separat-





ing force and repeating said steps of increasing and decreasing said separating force.

6,039,738

FASTENER

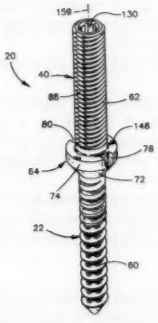
Marcus Maria Sanders, Cleveland Hts.; John Mark Kapitan, Shaker Hts., and Henry John Harding Brown, Solon, all of Ohio, assignors to Depuy Orthopaedics, Inc., Warsaw, Ind.

Continuation of application No. 08/887,832, Jul. 3, 1997, Pat. No. 5,899,902. This application Nov. 5, 1998, Appl. No. 186,567.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *17/70*

U.S. Cl. 606—61 **31 Claims**



1. A fastener for use in retaining vertebrae in a desired spatial relationship, said fastener comprising

a mount section having threads adapted to engage a vertebra,

a head extending radially outwardly from the mount, the head including an end surface facing away from the mount section, a side surface disposed in a generally coaxial relationship with the threads, and spaced-apart first and second recesses each having an opening that is at least partially defined by the side surface, the first and second recesses being separated by a continuous segment of the end surface that is generally free of discontinuities, and

a retainer coupled to the head and including second external threads adapted to engage an internally threaded member.

6,039,739

TARGETING APPARATUS FOR A LOCKING NAIL

Bernd Simon, Kiel, Germany, assignor to Howmedica GmbH, Germany

Filed Apr. 7, 1999, Appl. No. 287,895

Claims priority, application Germany, Apr. 9, 1998, 298 06 564 U

Int. Cl.[7] A61B *17/56*

U.S. Cl. 606—64 **14 Claims**

1. A targeting apparatus for a locking nail with a first section which is releasably connectable to the allocated end of the nail, with a bow-like second section connected to the first section, which comprises a receiving section running approximately parallel to the nail when the nail is connected to the first section and which comprises at least one transverse bore for the approximate fitting accommodation of a guiding sleeve, wherein the receiving section consists of a first part rigidly formed with the second section and facing the first section, and of an outer second part movable relative to the first part against spring force, wherein the transverse bore extends through both parts and the bore in the parts is selected such that with a relaxed second part the sleeve is held in a slightly clamping manner and with a certain adjustment of the second part towards the first part is freely displaceable in the bore.

6,039,740

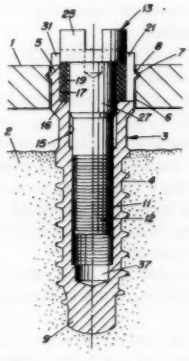
METHOD AND A DEVICE FOR IMPLANT LOCKING

Sven Olerud, Villa Malmen, S-740 11 Länna, Sweden

Filed Aug. 7, 1997, Appl. No. 908,188

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—72 **19 Claims**



1. An arrangement for locking implant elements to each other, comprising:

a first implant element having an end part;

a second implant element having a hole therein for receiving the end part, the first implant element extending through the hole;

a sleeve-shaped lock, an axial direction of the sleeve-shaped lock coinciding with an axial direction of the end part, the sleeve-shaped lock being arranged in a locking space in the form of an inner annular recess in the end part to rest with a lower end of the sleeve-shaped lock on a lower shoulder of the locking space; and

a tightening element screwed into tightening engagement with the first implant element while being engaged with the sleeve-shaped lock so as to compress the sleeve-shaped lock, the tightening element and the sleeve-shaped lock being arranged to cooperate such that the sleeve-shaped lock, during tightening of the tightening element, exerts a pressure directed at least essentially to all sides on circumferential wall parts of the end part to cause the wall parts to engage the second implant element and lock the first implant element and the second implant element together.

6,039,741

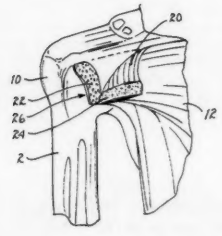
METHOD FOR SURGICAL REPAIR WITH HOOK-AND-LOOP FASTENER

Robert J. Meislin, 6234 N. 47th St., Paradise Valley, Ariz. 85253

Division of application No. 08/911,223, Aug. 15, 1997, Pat. No. 5,906,617. This application May 21, 1999, Appl. No. 316,221.

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—72 **34 Claims**



1. A method for re-attaching at least one of a tendon and ligament to bone comprising the steps of:

providing a first sheet of material;

providing a first component comprising hooks located on said first sheet of material;

providing a second sheet of material integrally connected to said first sheet of material;

providing a second component comprising loops on said second sheet of material;

each said first sheet and said second sheet of material, said hooks and said loops consisting essentially of tissue repair material, said hooks and said loops located opposite each other to facilitate coupling of said hooks to said loops;

exposing an unattached portion of at least one of a tendon and ligament requiring attachment;

exposing an attachment site on a bone for said unattached portion of said at least one of a tendon and ligament requiring attachment;

affixing one of said first sheet having said first component comprising hooks and said second sheet having said second component comprising loops to said unattached portion of at least one of a tendon and ligament requiring attachment;

affixing the other of said first sheet having said first component comprising hooks and said second sheet having said second component comprising loops to said attachment site on said bone to permit attachment of said unattached portion of said at least one of a tendon and ligament requiring attachment to said attachment site; and

fastening together said first and second components to provide a secure attachment of said bone to said one of a tendon and ligament.

6,039,742

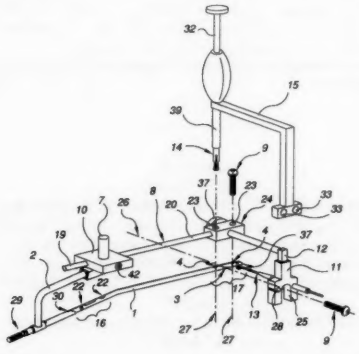
ALIGNMENT DEVICE FOR LOCKING THE BASE PART OF INTRAMEDULLARY NAILS

Christian Krettek, Hannover; Bernd Könemann, Celle, both of Germany; Alexandre Perrier, Basel, and Peter Senn, Waldenburg, both of Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Continuation of application No. PCT/CH97/00172, May 2, 1997. This application Nov. 3, 1998, Appl. No. 185,130.

Int. Cl.[7] A61B *17/58;17/00*

U.S. Cl. 606—96 **19 Claims**



1. An alignment device for positioning and inserting osteosynthetic fasteners in an intramedullary nail implanted in a bone, said alignment device comprising:

an alignment bracket detachably connectable to an intramedullary nail;

a coupling unit connected to the alignment bracket;

a longitudinal alignment bar having a first section which is longitudinally and rotationally movable within the coupling unit and a second section which includes at least one guide hole; and

a first spacing-sensor assembly attachable to the second section of the alignment bar and provided with a spacing sensor having a contact surface for placement against the intramedullary nail;

wherein:

the first section of the alignment bar is adjustable and lockable within the coupling unit for movement along the longitudinal axis of the alignment bar and is pivot-mounted within the coupling unit to permit rotational movement relative to the alignment bracket; and

the first spacing-sensor assembly permits the contact surface of the spacing sensor to shift transversely relative to the alignment bar and transverse to the spacing sensor longitudinal axis.

6,039,743

GUIDE WIRE HAVING DISTAL EXTREMITY WITH ADJUSTABLE SUPPORT CHARACTERISTIC AND METHOD

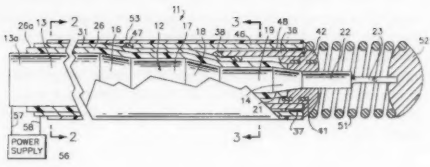
Dignah B. Quiachon, Mountain View; Deepak R. Gandhi, San Jose; Dennis L. Brooks, Windsor; Mir A. Imran, Los Altos Hills, and Roger J. Guidi, Los Altos, all of Calif., assignors to Intella Interventional Systems, Inc., Sunnyvale, Calif.

Division of application No. 08/585,885, Jan. 11, 1996, Pat. No. 5,697,380. This application Jul. 30, 1997, Appl. No. 902,772.

Int. Cl.[7] A61F *11/00;* **A61M** *29/00*

U.S. Cl. 606—108 **1 Claim**

1. A method for delivering a stent into a stenosis in a vessel in a patient by the use of a stent delivery catheter and a single guide wire having an adjustable support characteristic ranging from floppy to stiff comprising advancing the guide wire in the vessel of



the patient while its distal extremity is floppy until the distal extremity has been advanced into the stenosis in the vessel which is to be treated, stiffening the distal extremity of the guide wire, advancing the stent delivery catheter over the guide wire while the distal extremity is stiff, advancing the stent into the stenosis and withdrawing the stent delivery catheter and the guide wire from the vessel of the patient.

6,039,744

ASSEMBLY FOR POSITIONING AN IMPLANT IN AN INTERNAL PASSAGEWAY OF A BODY

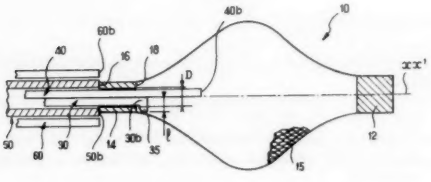
Simon John Forber, Yversay, France, assignor to B. Braun Celsa, Boulogne-Billancourt, France

Filed Dec. 4, 1998, Appl. No. 205,610

Claims priority, application France, Dec. 19, 1997, 97 16147

Int. Cl.[7] A61M *25/01*

U.S. Cl. 606—108 **11 Claims**



1. Assembly for positioning an implant in an internal passageway of a body, wherein the implant has an axis, at least one axial tubular region having an inside diameter, and a structure suitable for adopting a first, radially deployed, state in a situation implanted in the passageway, or a second, radially restricted, state in a positioning situation, said assembly comprising a first and second removable elongated elements slidably mounted inside a catheter having an inside and an outside diameter, the first and second elements cooperating closely for positioning or withdrawing the implant, the first and second elements having a predetermined cross-section and extending substantially parallel to one another, the first element only having, towards the distal end, a lateral protuberance having a radial length, while the other element has no such protuberance, a cumulative cross-section dimensions of the two elements away from their distal end, and the radial length of the lateral protuberance, being smaller than the inside diameter of the tubular region of the implant so that the elements pass through at their distal end in a situation of positioning the implant in the passageway, the lateral protuberance of the first element being disposed outside the catheter when the implant is in its first radially deployed state while the assembly is still retaining the implant, and the radial length of the lateral protuberance being smaller than a inside diameter of the catheter so that, once the implant is released and in place in the passageway, the second element can be pulled through the catheter to be withdraw.

6,039,745

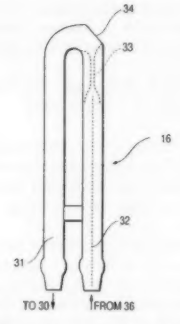
EQUIPMENT FOR MICRODERMOABRASION THROUGH A FLOW OF AIR/REDUCING SUBSTANCES MIX AND RELATIVE HANDPIECE

Dario Di Fiore, and Carlo Stanisci, both of Florence, Italy, assignors to Mattioli Engineering Ltd., London, United Kingdom

Division of application No. 08/496,470, Jun. 29, 1995, Pat. No. 5,810,842. This application Mar. 20, 1998, Appl. No. 44,860. This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61B *17/50*

U.S. Cl. 606—131 **6 Claims**



1. A handpiece for a microdermoabrasion device, wherein the handpiece is a U-shaped monoblock, the handpiece further comprising:

a window being raked at an angel between 30° and 60° with respect to a central symmetrical axis of the handpiece,

wherein the handpiece comprises a pipe arranged in a U-shape,

wherein the pipe has a first portion for receiving an air/reducing mixture for application to a patient, and a second portion for outputting the air/reducing mixture after application to the patient,

wherein the first and second portions are each cylindrically shaped and are spaced substantially parallel with respect to each other with an air gap situated therebetween, and

wherein the window is disposed on the first portion.

6,039,746

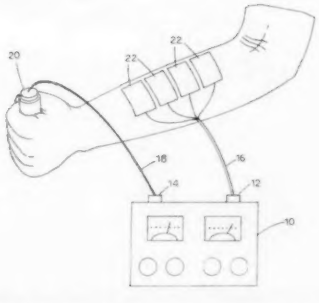
PATCH ELECTROLYSIS SYSTEM AND METHOD FOR REMOVING HAIR FROM SKIN

Hubert L. Cole, 160 S. May St., Southern Pines, N.C. 28387, and Mark H. Chandler, 830 Monticello Dr., Pinehurst, N.C. 28374

Filed Mar. 29, 1999, Appl. No. 280,926

Int. Cl.[7] A61B *17/50*

U.S. Cl. 606—133 **13 Claims**



1. A method of performing electrolysis treatment on a patient via a patch, comprising:

a. securing a patch to a person's skin and providing a gel interface between the patch and the person's skin; and

b. directing a DC current through the patch and in the process directing the DC current to multi-hair follicles underlying the patch so as to perform an electrolysis treatment on certain hair follicles underlying the patch.

6,039,747

ROTATIONAL ATHERECTOMY DEVICE WITH IMPROVED OPTICAL TACHOMETER

Leonid Shturman, Minneapolis, Minn.; Georgiy Morov, and Vladimir Malgichev, both of Moscow, Russian Federation, assignors to Shturman Cardiology Systems, Inc., Minneapolis, Minn.

Filed Apr. 8, 1998, Appl. No. 57,364

Int. Cl.[7] A61B *17/22*

U.S. Cl. 606—159 **18 Claims**

1. A rotational atherectomy device, comprising:

a) a prime mover having a prime mover shaft;

b) a flexible drive shaft rotatable together with the prime mover;

c) a handle having a prime mover carriage which carries the prime mover; and

d) a generally cylindrical optical reflector mounted on the prime mover shaft, the reflector having a light-reflective outer surface, a longitudinal bore through which the prime mover shaft extends and a transverse bore extending through the reflector along an axis which is generally perpendicular to the prime mover shaft so that the prime mover shaft obstructs passage of light along the axis of the transverse bore.

6,039,748

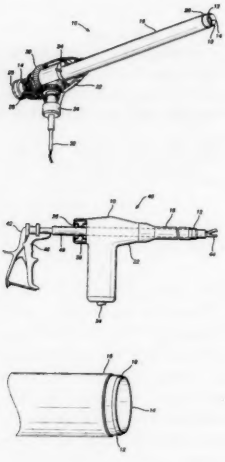
DISPOSABLE LAPAROSCOPIC MORCELLATOR

George M. Savage, Portola Valley; Jeffrey J. Christian, San Jose, and David Curtis Dillow, Cupertino, all of Calif., assignors to FemRx, Inc., Sunnyvale, Calif.

Filed Aug. 5, 1997, Appl. No. 906,358

Int. Cl.[7] A61B *17/14*

U.S. Cl. 606—180 **14 Claims**



1. A device for surgically removing tissue from a patient body, the device comprising:

an outer tube having a proximal end and a distal end;

an inner tube within the outer tube, the inner tube defining a lumen having an open distal end and an open proximal end, the inner and outer tubes defining an annular space therebetween; and

a cutting member which rotates within the annular space relative to the inner and outer tubes, the cutting member having an exposed cutting surface having a position distal the open distal end.

6,039,749

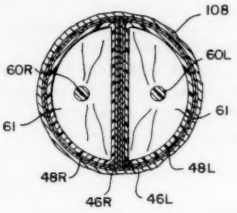
METHOD AND APPARATUS FOR DEPLOYING NON-CIRCULAR STENTS AND GRAFTSTENT COMPLEXES

Michael L. Marin, and Ralph Marin, both of New York, N.Y., assignors to Endovascular Systems, Inc., Cross River, N.Y.

Continuation of application No. 08/537,630, Oct. 2, 1995, Pat. No. 5,695,517, and a division of application No. 08/324,893, Oct. 18, 1994, Pat. No. 5,507,769, and a continuation-in-part of application No. 08/196,278, Feb. 10, 1994, Pat. No. 5,443,477. This application Apr. 15, 1997, Appl. No. 838,126. This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61M *29/00*

U.S. Cl. 606—198 **19 Claims**



1. A stent having a non circular cross-section when expanded, comprising:

a tubular wall defining a curved edge and an alignment edge; and

an orientation marker positioned on said tubular wall with a predetermined rotational relationship relative to said alignment edge.

6,039,750

URETHRAL OCCLUSION DEVICE FOR MAINTAINING URINARY BLADDER RETENTION AND METHOD OF USE

Thomas P. Kubalak, Plymouth, Minn.; Peter Sheperd, Santa Barbara, Calif., and Jeffrey P. LaPlante, Minneapolis, Minn., assignors to Mentor Corporation, Santa Barbara, Calif.

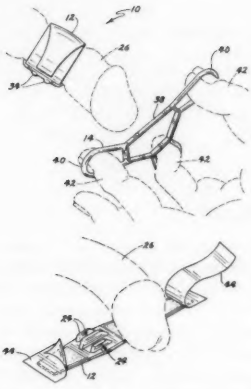
Continuation-in-part of application No. 08/760,906, Dec. 3, 1996. This application Apr. 10, 1997, Appl. No. 838,724.

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—201 **45 Claims**

1. A urethral occlusion device for retaining urine in the bladder of a male patient having a penis and a urethra by occluding said urethra, said penis also having blood circulating through a vascular system therein, said apparatus comprising:

an occlusion band which is wrapped circumferentially about the penis and is fabricated from a flexible, deformable, elastomeric material, said occlusion band having an inner surface and an outer surface when wrapped about the penis, said occlusion band defining at least one region having an intrinsically tacky surface to contact and adhere to the penis and to said outer surface of said occlusion band, said occlusion band further defining at least one rib member extending from said inner surface of said occlusion band generally inward toward the urethra, said at least one rib member being generally



pliant and deformable, said occlusion band applying sufficient pressure on said at least one rib member so as to press said at least one rib member inwardly into the penis so as to alter the path of the urethra and cause the urethra to stretch and become occluded to obstruct the flow of urine from the bladder, while simultaneously the occlusion band does not significantly interfere with the flow of blood circulating through the vascular system of the penis of the patient.

6,039,751

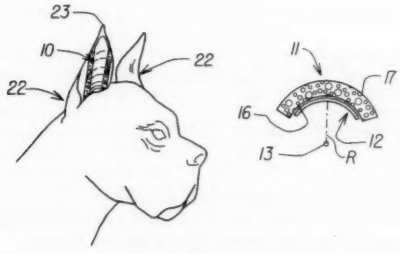
SUPPORT DEVICE FOR NEWLY CROPPED EARS OF DOGS

Cynthia G. Hardee, 117 Arlington Ave., Colonial Heights, Va. 23834

Filed Mar. 8, 1999, Appl. No. 263,537

Int. Cl.[7] A61F *5/08*

U.S. Cl. 606—204.15 **8 Claims**



1. A disposable device for supporting dog's ears, said device comprising:

a) an outer member elongated upon a straight axis and fabricated as a monolithic piece of closed cell polymer foam material bounded by upper and lower transverse edges, parallel concave interior and convex exterior cylindric surfaces having uniform curvatures centered upon-said axis, and opposed longitudinal edges, and

b) a protective piece of thin plastic material adhered to the interior surface of said outer member in a manner to preserve the concave contour of said interior surface, and extending from said upper transverse edge toward said lower transverse edge.

6,039,752

TREATING INSTRUMENT FOR OPERATION AND MEDICAL DEVICE USING THE TREATMENT DEVICE

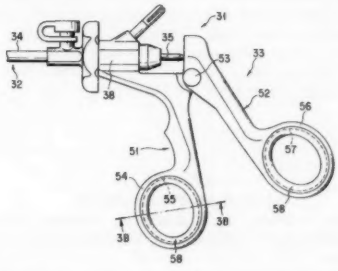
Kenichi Kimura, Hachioji; Akira Shiga, Hidaka; Toshihiko Hashiguchi, Sagamihara; Eiji Murakami, Hachioji, and Katsumi Sasaki, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1997, Appl. No. 881,892

Claims priority, application Japan, Sep. 4, 1996, 8-234280; Jun. 6, 1997, 9-149037

Int. Cl.[7] A61B *17/28*

U.S. Cl. 606—205 **14 Claims**



1. A treating instrument for an operation comprising:

a main body;

an operation section provided on a base end portion of said main body, said operation section including a first handle including first finger contacting means for contacting a first one of an operator's finger, a second handle including second finger contacting means for contacting at least a second one of the operator's fingers, and coupling means for coupling said first and second handles to be relatively movable;

a treating section provided on a top end portion of said main body, said treating section including a movable element which is operable in response to a relative moving operation between said first and second handles; and

load reducing means for reducing a load on the operator's fingers contacting said first and second finger contacting means, said load reducing means being provided on a section of at least one of said first and second finger contacting means which contacts the operator's fingers;

wherein said load reducing means comprises an elastic contacting member which is provided to be freely detachable from at least one of said first and second finger contacting means.

6,039,753

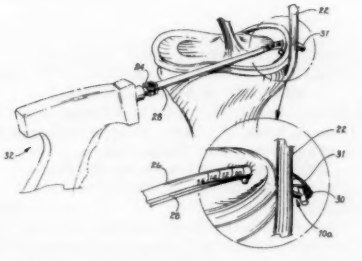
SINGLE UNIT SURGICAL FASTENER AND METHOD

Robert Meislin, 6234 N. 47 St., Paradise Valley, Ariz. 85253

Filed Jul. 16, 1998, Appl. No. 116,512

Int. Cl.[7] A61B *17/00*

U.S. Cl. 606—213 **30 Claims**



1. A system for repairing torn meniscus tissue comprising, in combination:

a single unit surgical fastener comprising:

a base member;

a substantially rod-shaped shaft extending from said substantially rod-shaped member; and

a retaining member at an end of said substantially rod-shaped shaft;

means for positioning and inserting said single unit surgical fastener into said torn meniscus tissue comprising:

a slotted cannula having a first section having an axial bore and a second section continuous with said first section and curved so as to conform to the shape of a knee and to extend laterally from an axis established by said axial bore;

a sharpened tip located at a distal end of said second section;

said slotted cannula being dimensioned to receive said base member of said single unit surgical fastener; and

insertion means dimensioned to fit within said slotted cannula for inserting said single unit surgical fastener through said torn meniscus tissue.

6,039,754

VASCULAR PROSTHESES

Colin Caro, London, United Kingdom, assignor to Imperial College of Science Technology & Medicine, London, United Kingdom

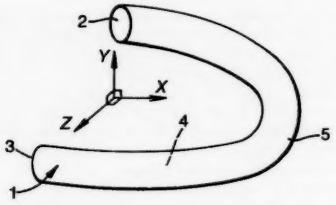
PCT No. PCT/GB94/02023, § 371 Date May 28, 1996, § 102(e) Date May 28, 1996, PCT Pub. No. WO95/09585, PCT Pub. Date Apr. 13, 1995

PCT Filed Sep. 16, 1994, Appl. No. 624,433

Claims priority, application United Kingdom, Oct. 1, 1993, 9320288; Jun. 27, 1994, 9412882

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **19 Claims**



1. A vascular prosthesis comprising a length of generally hollow tubing having openings at both ends thereof, said hollow tubing having at least a portion lying in one of two mutually perpendicular planes, and including at least one curved portion whose curvature extends out of said two mutually perpendicular planes and thereby induces swirl flow in a liquid medium when such medium flows through said curved portion, the vascular prosthesis maintaining its shape prior to implantation.

6,039,755

RADIALLY EXPANDABLE TUBULAR POLYTETRAFLUOROETHYLENE GRAFTS AND METHOD OF MAKING SAME

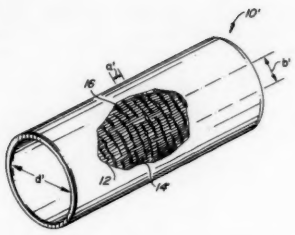
Tarun J. Edwin; Fariba Hurry, both of Tempe, and Christopher E. Banas, Mesa, all of Ariz., assignors to Impra, Inc., a Division of C.R. Bard, Inc., Tempe, Ariz.

Filed Feb. 5, 1997, Appl. No. 794,871

Int. Cl.[7] A61F *2/06;2/04*

U.S. Cl. 623—1 **14 Claims**

1. A continuous tubular structure comprising an expanded polytetrafluoroethylene material having a predetermined wall thickness and a microstructure characterized by a plurality of nodes interconnected by fibrils, the fibrils having an orientation substantially parallel to a longitudinal axis of the polytetrafluoroethylene tubular



material throughout the wall thickness of the tubular structure and the nodes having a longitudinal axis substantially perpendicular to the longitudinal axis of the polytetrafluoroethylene material, the polytetrafluoroethylene material of the tubular structure being capable of undergoing radial deformation from an original unexpanded diameter of the tubular structure to a larger diameter of the tubular structure by application of a positive pressure applied through the lumen of the tubular structure and radially outward therefrom which causes a plurality of the nodes in the microstructure to undergo elongation along the longitudinal axis of the nodes, while substantially retaining an average internodal distance throughout the wall thickness of the radially deformed tubular structure.

6,039,756

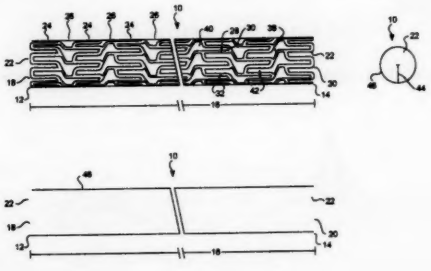
INTRAVASCULAR STENT

G. David Jang, 30725 Eastburn La., Redlands, Calif. 92374

Provisional application No. 60/017,484, Apr. 26, 1996. This application Oct. 14, 1997, Appl. No. 949,865.

Int. Cl.[7] A61F *2/06*

U.S. Cl. 623—1 **9 Claims**



1. A stent in a non-expanded state, comprising:

a first column expansion strut pair, a plurality of the first column expansion strut pair forming a first expansion column;

a second column expansion strut pair, a plurality of the second column expansion strut pair forming a second expansion column; and

a first serial connecting strut, a plurality of first serial connecting struts forming a first connecting strut column, the plurality of first serial connecting struts coupling the first expansion column to the second expansion column and at least a portion of the plurality of the first serial connecting struts have a first stair-step with a first slant angle arc of greater than 90° and a second stair-step stair-step with a second slant angle arc of greater than 90°; and

wherein the first expansion column, the second expansion column, and the first connecting strut column form a plurality of geometric cells and at least a portion of the plurality are asymmetrical geometric cells.

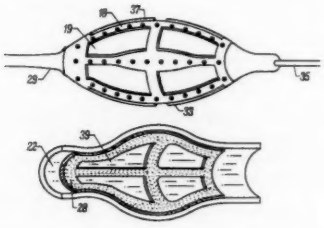
6,039,757
IN SITU FORMED FENESTRATED STENT

Stuart D. Edwards, Portola Valley; Thomas C. Wehman, Cupertino; Theodore L. Parker, Danville; Theodore Kucklick, Los Gatos; Eugene V. Skalnyi, Mountain View, and Alan Stein, Moss Beach, all of Calif., assignors to Cardio-Synopsis, Inc., Sunnyvale, Calif.

Continuation-in-part of application No. 08/857,323, May 16, 1997, which is a continuation-in-part of application No. 08/815,096, Mar. 12, 1997, and a continuation-in-part of application No. 08/982,120, Dec. 1, 1997, and a continuation-in-part of application No. 08/982,247, Dec. 1, 1997, and a continuation-in-part of application No. 08/984,481, Dec. 1, 1997. This application Dec. 1, 1997, Appl. No. 982,246.

Int. Cl.[7] **A61F** *2/06*

U.S. Cl. 623—1 **32 Claims**



1. A fenestrated stent formed in a body lumen comprising:

an article shaped to provide support to a section of a body lumen and allow biological material which would otherwise flow through the body lumen to flow through the article, the article being formed with fenestrations by

delivering a fluent pre-stent composition to a mold space defined by a section of a body lumen and a fluent pre-stent composition delivery device having members which define the fenestrations, and

transforming the fluent pre-stent composition to a non-fluent stent composition within the mold space.

6,039,758
METHOD FOR INTRALUMINALLY DEPLOYING A BIFURCATED GRAFT

Dinah B. Quiachon, San Jose; Alec A. Piplani, Mountain View; Steve G. Baker, Sunnyvale; Ronald G. Williams, Menlo Park; Richard S. Williams, Sunnyvale; Kenneth L. Osborn, Mountain View; Ted W. Layman, Palo Alto, and Peter K. Johansson, San Jose, all of Calif., assignors to Endovascular Technologies, Inc., Menlo Park, Calif.

Continuation of application No. 08/707,179, Sep. 3, 1996, Pat. No. 5,824,044, and a continuation-in-part of application No. 08/241,476, May 12, 1994, Pat. No. 5,628,783. This application Dec. 22, 1997, Appl. No. 996,330.

Int. Cl.[7] **A61F** *2/06*

U.S. Cl. 623—1 **8 Claims**

1. A method for repairing a vessel at a bifurcation using a multicapsule catheter having first, second and third capsules for releasably retaining each terminal end of a bifurcated graft, a torque catheter and a stub nose balloon catheter, comprising the steps of:

performing a surgical technique to gain remote access to each branch of the bifurcated vessel;

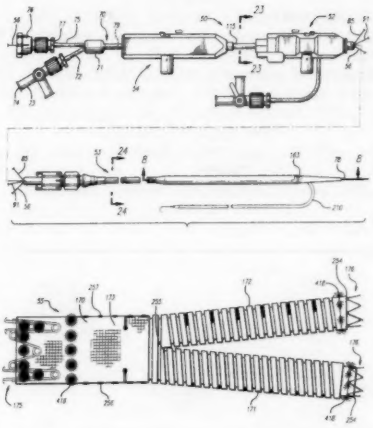
advancing the multicapsule catheter within a first branch of the bifurcated vessel;

configuring the first capsule of the multicapsule catheter in a position distal to the bifurcation;

configuring the second capsule of the multicapsule catheter in the first branch of the bifurcated vessel;

configuring the third capsule of the multicapsule catheter in the second branch of the bifurcated vessel;

releasing the first capsule from the graft;



advancing the torque catheter within the second branch of the bifurcated vessel until the torque catheter engages the third capsule;

removing any undesirable regularities in the graft residing in the second branch of the bifurcated vessel;

releasing the third capsule from the graft;

releasing the second capsule from the graft; and

withdrawing the multicapsule catheter and the torque catheter from the repair cite.

6,039,759
MECHANICAL PROSTHETIC VALVE WITH COUPLED LEAFLETS

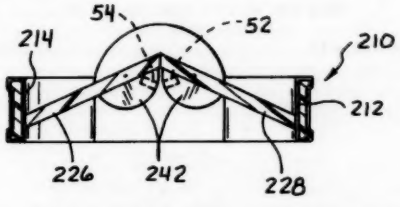
Alain Carpentier, Paris, France; George X. Guo, Dove Canyon, and Stefan G. Schreck, Vista, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation-in-part of application No. 08/694,580, Aug. 9, 1996, Pat. No. 5,814,100. This application Jul. 23, 1998, Appl. No. 121,474.

Claims priority, application France, Feb. 20, 1996, 96 02052

Int. Cl.[7] **A61F** *2/24*

U.S. Cl. 623—2 **15 Claims**



1. A valve for human implantation, said valve comprising:

a tubular base portion defining a blood flow pathway therethrough;

a pair of rigid valve leaflets pivotally disposed on an inner surface of said base portion in said blood flow pathway and responsive to blood fluid pressure to pivot between a first position of occluding cooperation both with each other and with said base portion to inhibit blood flow in said pathway, and a second fully open pivotal position opening blood flow in said pathway, wherein a third position is defined substantially intermediate the first and second positions; and

a first means carried on one leaflet for cooperating with a second means carried on the other leaflet to couple the movement of the leaflets between the first and second positions and bias the leaflets toward the third position from both the first and second positions.

6,039,760

COMPOSITE LIVING SKIN EQUIVALENT

Mark Eisenberg, Dover Heights, Australia, assignor to Ortec International, Inc., New York, N.Y.

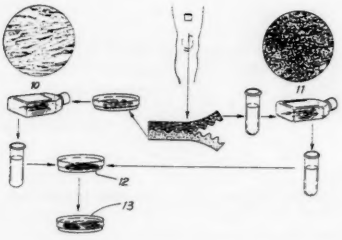
Continuation of application No. 08/123,860, Sep. 20, 1993, abandoned, which is a division of application No. 07/777,419, Nov. 27, 1991, Pat. No. 5,282,859. This application Feb. 16, 1996, Appl. No. 602,271.

Claims priority, application Australia, Apr. 24, 1990, PJ9819; Jan. 22, 1991, PK4302

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61F *2/10*

U.S. Cl. 623—15 **13 Claims**



1. A composite which comprises relative to a horizontal plane:

a) a first layer comprising a collagen matrix having upper and lower surfaces, said matrix being capable of permitting the growth of fibroblast cells therein, and being essentially non-contractible,

b) a non-porous second layer essentially free of exogenous glycosaminoglycans, said layer comprising a non-porous collagen layer having upper and lower surfaces, the lower surface thereof being in contact with the upper surface of said first layer, and being sufficiently non-porous to be capable of maintaining on its surface keratinocyte cells without the substantial invasion of said cells into said collagen matrix.

6,039,761

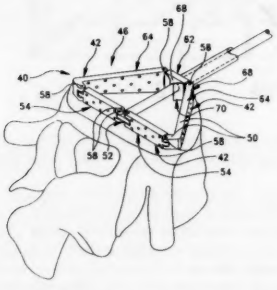
INTERVERTEBRAL SPACER AND TOOL AND METHOD FOR EMPLACEMENT THEREOF

Lehmann K. Li, Milford, and Rhodemann Li, Greenwich, both of Conn., assignors to Li Medical Technologies, Inc., Shelton, Conn.

Filed Feb. 12, 1997, Appl. No. 798,113

Int. Cl.[7] A61F *2/44*

U.S. Cl. 623—17 **20 Claims**



1. An intervertebral spacer comprising a plurality of discrete wall elements connected in series to form a body; said discrete wall elements being collapsible to a first non-expanded configuration, said first non-expanded configuration including at least some of said discrete wall elements being disposed internally of others of said discrete wall elements; and expandable to a second configuration, said second configuration including said discrete wall elements forming said body to define an outer expanded periphery of said body.

6,039,762

REINFORCED BONE GRAFT SUBSTITUTES

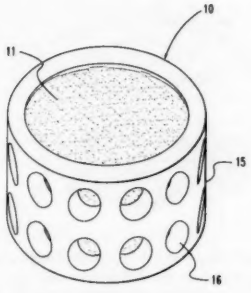
William F. McKay, Memphis, Tenn., assignor to SDGI Holdings, Inc., Wilmington, Del.

Continuation-in-part of application No. 08/485,842, Jun. 7, 1995, Pat. No. 5,702,449. This application Jun. 11, 1997, Appl. No. 872,689.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61F *2/44*

U.S. Cl. 623—17 **36 Claims**



1. An interbody fusion spacer, comprising:

a body having an outer surface and a height approximating the height of a human disc space, said body composed of a porous, biocompatible ceramic material for permitting tissue ingrowth therethrough; and

a reinforcing sleeve disposed around said outer surface of said body, said sleeve including a material relatively stronger under compression than said porous, biocompatible ceramic material; and

said reinforcing sleeve having an inner surface defining a chamber, said chamber having an inner dimension that is slightly smaller than said body so as to engage said sleeve to said body.

6,039,763

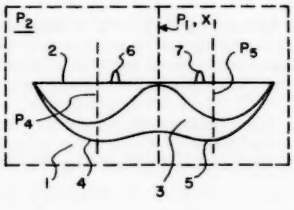
ARTICULATING SPINAL DISC PROSTHESIS

Alexis P. Shelokov, Dallas, Tex., assignor to Disc Replacement Technologies, Inc., Dallas, Tex.

Filed Oct. 27, 1998, Appl. No. 179,324

Int. Cl.[7] A61F *2/44;2/30;2/38*

U.S. Cl. 623—17 **25 Claims**



1. An artificial spinal disc which articulates, said disc comprising:

a first plate having a first outer periphery, a substantially flat first superior surface, a first inferior articulating surface, a first

anterior end, a first posterior end, a first lateral side and a second lateral side; and

a second plate having a second outer periphery, a substantially flat second inferior surface, a second superior articulating surface, a second anterior end, a second posterior end, a third lateral side and a fourth lateral side;

wherein:

said first and second plates can articulate in an anteroposterior fashion when said first inferior surface, said first anterior end and said first posterior end are juxtaposed said second superior surface, said second anterior end and said second posterior end, respectively;

at least one of said first inferior articulating surface and said second superior articulating surface comprises a changing anteroposterior arc of radius; and

said disc has an instant center of rotation in flexion which moves in an anteroposterior direction during anteroposterior articulation of said disc.

6,039,764

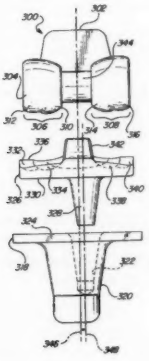
PROSTHETIC KNEE WITH ADJUSTED CENTER OF INTERNAL/EXTERNAL ROTATION

Lawrence A. Pottenger, and Louis F. Draganich, both of Chicago, Ill., assignors to ARCH Development Corporation, Chicago, Ill.

Filed Aug. 18, 1997, Appl. No. 912,506

Int. Cl.[7] A61F *2/38*

U.S. Cl. 623—20 **13 Claims**



1. An implantable prosthetic device adapted to form a knee joint between a femur and a tibia as a replacement for a natural knee joint having a medial tibial eminence corresponding to a natural center of internal/external rotation relative to a longitudinal axis of at least one of said femur and said tibia, said device comprising:

first fixation means adapted for fixation to a remaining portion of a femur;

second fixation means adapted for attachment to a remaining portion of a tibia; and

a bearing element disposed between said first fixation means and said second fixation means;

wherein engagement of at least one of said first fixation means and said second fixation means with said bearing element allows a component of internal/external rotation of said device relative to a longitudinal axis of at least one of said femur and said tibia, said component of internal/external rotation defining a center of internal/external rotation of said device between said femur and said tibia;

wherein said center of internal/external rotation of said device is adjusted to a displaced location to achieve at least one advantage selected from the group consisting of enhancing performance, minimizing wear, compensating for wear and mimicking said natural center of internal/external rotation of said natural joint; and

wherein said adjusted location of said center of internal/external rotation of said device generally corresponds to the location of the natural medial tibial eminence, so as to allow said internal/external rotation of said device to approximate said natural center of internal/external rotation.

6,039,765

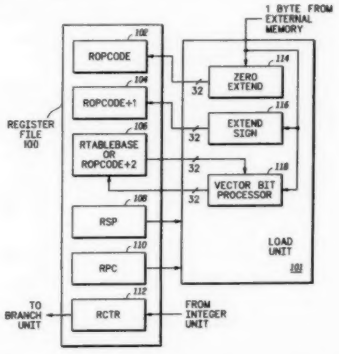
COMPUTER INSTRUCTION WHICH GENERATES MULTIPLE RESULTS OF DIFFERENT DATA TYPES TO IMPROVE SOFTWARE EMULATION

David Wesley Trissel, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1997, Appl. No. 990,780

Int. Cl.[7] G06F *9/455*

U.S. Cl. 703—26 **27 Claims**



1. A processor capable of executing a multifunction instruction comprising:

a plurality of registers; and

a multifunction instruction execution circuit, wherein:

the multifunction instruction execution circuit moves a plurality of operands in a corresponding plurality of formats into a corresponding plurality of registers from a common location in response to a single execution of the multifunction instruction;

wherein:

a first one of the corresponding plurality of formats is an integer encoded in memory in an unsigned byte format,

a second one of the corresponding plurality of formats is an integer encoded in memory in a signed byte format, and

a third one of the corresponding plurality of formats is generated by the processor by inserting a fixed number of bits from the common location into a fixed location in a third one of the corresponding plurality of registers.

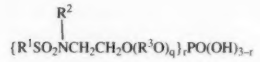
6,039,766
CLEANING PROCESS FOR DRY CLEANING

Yuhei Mizuno, Fukui; Yoshihiro Kawamura, Sakai-gun, and Shiro Kondo, Sabae, all of Japan, assignors to Nicca Chemical Co., Ltd., Fukui, Japan

Filed Oct. 19, 1998, Appl. No. 174,310
Claims priority, application Japan, Nov. 6, 1997, 9-304438
Int. Cl.[7] D06L *1/04;* **C11D** *3/24;3/26*
U.S. Cl. 8—142 **4 Claims**

1. A process for dry cleaning fabric, said process comprising the step of cleaning fabric by applying an effective amount of a cleaning composition for dry cleaning which comprises 1 to 90% by weight of a surfactant containing fluorine and 10 to 99% by weight of a fluorohydrocarbon solvent and/or an auxiliary solubilizing agent, wherein the surfactant containing fluorine is a salt of a phosphoric acid ester of a polyoxyalkylenealkylsulfonamide ether containing fluorine which is represented by general formula (1):

(1)



wherein R^1 represents a perfluoroalkyl group having 3 to 12 carbon atoms, R^2 represents an alkyl group having 1 to 5 carbon atoms, R^3 represents an alkylene group having 2 to 4 carbon atoms, q represents a number of 0 to 10, and r represents a number of 1 or 2,

wherein said step of cleaning with a composition which includes the fluorohydrocarbon solvent includes the further step of providing an alkoxyperfluoroalkane represented by general formula (5):

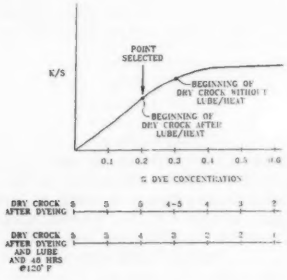
(5)

wherein n represents a number of 3 or 4, and m represents a number of 1 to 3.

6,039,767
BLENDED DYES AND PROCESS FOR DYEING POLYPROPYLENE FIBERS

Geoffrey E. Boyes, Roanoke, Va., and Michel A. Herlant, Charlotte, N.C., assignors to Equistar Chemicals, LP, Houston, Tex.

Filed May 19, 1997, Appl. No. 858,739
Int. Cl.[7] D06P *3/79;1/16*
U.S. Cl. 8—400 **35 Claims**



1. A method of dyeing a polypropylene based material modified with an ethylene copolymer, comprising:

preparing various disperse dye dispersions each comprising an individual disperse dye at a known dye concentration;

contacting undyed polypropylene material samples with each of the various disperse dye dispersions to produce a plurality of dyed polypropylene material samples;

testing the dyed polypropylene samples to determine crocking the characteristics for each of the various disperse dyes;

for each of various disperse dyes, determining a maximum dye concentration which will produce an acceptable crocking test;

for each of various disperse dyes within a common primary color group, selecting a plurality of disperse dyes each substantially at its determined maximum dye concentration;

combining the selected plurality of disperse dyes to form a primary color dye mix;

preparing a disperse dye mix dispersion from the primary color dye mix; and

contacting undyed polypropylene material with the disperse dye mix dispersion to dye the polypropylene material.

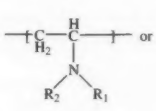
6,039,768
PROCESS FOR THE TREATMENT OF DYED CELLULOSIC FIBER MATERIAL

Philippe Ouziel, Altkirch, France, assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

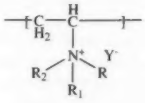
Filed Jun. 6, 1997, Appl. No. 870,626
Claims priority, application Switzerland, Jun. 11, 1996, 1458/96
Int. Cl.[7] D06P *1/52;1/56;3/66*
U.S. Cl. 8—543 **11 Claims**

1. A process for fixing reactive or substantive dyes on cellulosic fibre material, which process comprises treating the fibre before, during or after dyeing in a temperature range from 20 to 70° C. with a liquor comprising a homo- or copolymer containing repeating structures of formula

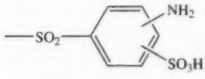
(1a)



(1b)



wherein R_1 is C_1–C_{12}alkyl which is unsubstituted or substituted by hydroxy, carboxy, cyano, carbamoyl, a radical —CONH—(alk)—T, N,N-di-C_1–C_4alkylcarbamoyl, aminophenylsulfonyl, amino or radical $—NHR_3$, $—N(R_3)_2$, $—N(R_3)_3{}^+Y^-$, —COO—(alk)—T or



T is hydrogen or a radical $—NH_2$, $—NHR_3$, $—N(R_3)_2$, $—N(R_3)_3{}^+Y^-$,

R_3 is C_1–C_8alkyl,

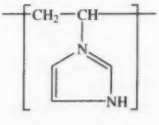
Y^- is an anion,

(alk) is a straight-chain or branched C_1–C_{10}alkylene radical, and

R and R_2 are each independently of the other hydrogen or benzyl or independently have one of the meanings given above for R_1, or

a copolymer containing repeating structures of formula

(2)



which is obtained by polymerising 80 to 20 mol % of vinylimidazole and 20 to 80 mol % of N-vinylformamide or

N-vinylpyrrolidone, or by polymerising N-vinylimidazole, N-vinylpyrrolidone and N-vinylformamide, and where required, with subsequent hydrolysis, or mixtures thereof.

6,039,769

PROCESS FOR THE PREPARATION OF HIGHLY CHROMATIC PERYLENE PIGMENTS

Gregory R. Schulz, and Michael J. Greene, both of Mt. Pleasant, S.C., assignors to Bayer Corporation, Pittsburgh, Pa.

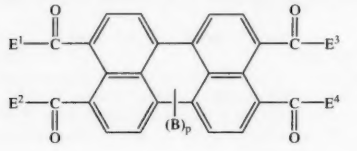
Filed Dec. 15, 1998, Appl. No. 211,728

Int. Cl.[7] **C09B** *67/20;* **C07D** *207/26*

U.S. Cl. 8—574 **6 Claims**

1. A process for preparing a perylene pigment composition comprising reacting

(a) a perylene tetracarboxylic compound having the formula



wherein

E^1 and E^3 are independently OR or $NR'R''$ and E^2 and E^4 are independently OR, or E^1 and E^2 together are O or NA^1 and E^3 and E^4 together are O or NA^2,

each R is independently hydrogen, a metal or ammonium cation, C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl,

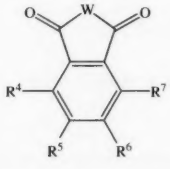
each R' and R" is independently hydrogen, C_1–C_6 alkyl, or C_7–C_{16} aralkyl,

A^1 and A^2 are independently hydrogen, a metal, C_1–C_6 alkyl or substituted C_1–C_6 alkyl, C_5–C_8 cycloalkyl or substituted C_5–C_8 cycloalkyl, C_7–C_{16} aralkyl or substituted C_7–C_{16} aralkyl, or C_6–C_{10} aryl or substituted C_6–C_{10} aryl,

B is C_{1-C6} alkyl, C_1–C_6 alkoxy, a sulfonyl group, amino, ammonium, hydroxy, nitro, or halogen, and

p is zero or an integer of from 1 to 8;

(b) about 0.01 to about 20% by weight, relative to the perylene tetracarboxylic compound, of a non-pigmentary imide having the formula



wherein

W NR[1],

R^1 is hydrogen, a metal, C_1–C_6 alkyl, or —Alk—X,

R^4, R^5, R^6, and R^7 are independently hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, a sulfonyl group, amino, ammonium, hydroxy, nitro, or halogen,

Alk is C_1–C_{18} alkylene, and

X is $—SO_3^-$ or $—COO^-$ electrically balanced with hydrogen or a stoichiometric amount of a metal ion;

(c) ammonia or a primary amine having the formula $R^A—NH_2$ wherein R^A is C_1–C_6 alkyl, C_7–C_{16} aralkyl, or C_6–C_{10} aryl;

(d) optionally, a solvent; and

(e) optionally, one or more additives.

6,039,770

SEMICONDUCTOR DEVICE MANUFACTURING SYSTEM HAVING MEANS FOR REDUCING A PRESSURE DIFFERENCE BETWEEN LOADLOCK AND PROCESSING CHAMBERS

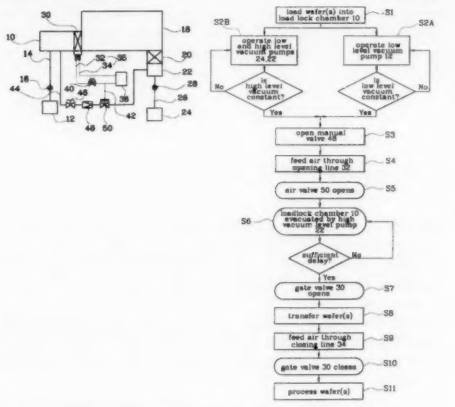
Yun-sik Yang; Hun Cha, both of Suwon, and Seung-ki Chae, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 5, 1998, Appl. No. 90,862

Claims priority, application Rep. of Korea, Jun. 25, 1997, 97-27092

Int. Cl.[7] **C23C** *14/00*

U.S. Cl. 29—25.01 **17 Claims**



1. A semiconductor manufacturing system comprising:

a loadlock chamber;

a low level vacuum pump connected to said loadlock chamber so as to create a low level vacuum in said loadlock chamber;

a processing chamber in which a semiconductor manufacturing process is carried out while the processing chamber is maintained at a high level vacuum of a pressure that is less than that of said low level vacuum;

a gate valve interposed between and connecting said loadlock chamber and said processing chamber, said gate valve being movable between a closed position at which said processing chamber is isolated from said loadlock chamber and an open position at which said chambers are open to each other so as to facilitate the transfer of objects from said loadlock chamber to said processing chamber; and

pressure relieving means for reducing the pressure difference between the low level vacuum of said loadlock chamber and the high level vacuum of said processing chamber when the gate valve is moved from said closed to said open position thereof.

6,039,771

FORMULATION AND METHOD OF PREPARATION OF ENERGY FORTIFIED DIESEL FUEL

Charles W. Selvidge, and Dennis A. Vauk, both of Wichita, Kans., assignors to KRC-GP, Inc., Wichita, Kans.

Filed Apr. 23, 1998, Appl. No. 65,237

Int. Cl.[7] **C10L** *1/08*

U.S. Cl. 44—311 **36 Claims**

1. An energy fortified diesel fuel, comprising a mixture of:

a hydrocarbon additive that is the distillate of a heavy hydrocarbon fraction wherein greater than about 50% of said hydrocarbon additive vaporizes at or above about 650° F.; and

a diesel fuel component wherein about 90% of said diesel fuel vaporizes at or below about 640° F., or wherein about 95% of said diesel fuel vaporizes at or below about 698° F.

20. A process for making an energy fortified hydrocarbon additive, consisting of:

(a) distilling a heavy hydrocarbon fraction consisting of slurry oil or heavy cycle oil obtained from an FCC unit or a heavy hydrocarbon fraction obtained from a steam cracker unit to remove contaminants wherein said distillation is performed at a temperature of between about 500 and 750° F. and at a pressure between about 1 mm Hg and 10 psig; and

(b) removing distillate from said step (a) distillation wherein said distillate is used as an energy fortified hydrocarbon additive.

6,039,772

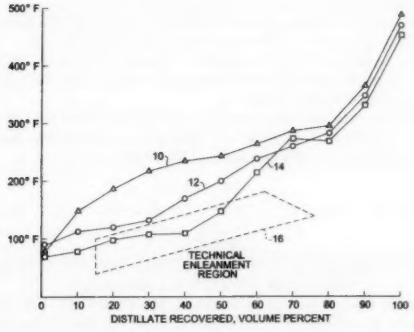
NON LEADED FUEL COMPOSITION

William C. Orr, 1242 S. Gilpin, Denver, Colo. 80210

Continuation of application No. 07/511,896, Apr. 10, 1990, abandoned, which is a continuation of application No. 06/770,836, Aug. 28, 1985, abandoned, which is a continuation-in-part of application No. 06/670,556, Oct. 9, 1984, abandoned. This application Apr. 13, 1995, Appl. No. 421,281.

Int. Cl.[7] **C10L** *1/12;1/18*

U.S. Cl. 44—359 **52 Claims**



1. A fuel composition comprising:

an unleaded hydrocarbon base fuel having an olefinic content;

a cyclopentadienyl manganese tricarbonyl antiknock compound having a manganese concentration from about 0.001 to about 1.0 gram of elemental manganese per gallon of said fuel composition; and

an oxygenate comprising 0.05 to 14.2 weight percent oxygen of the fuel composition and selected from the group consisting of methanol and ethanol and mixtures thereof,

wherein a boiling temperature is associated with the T50 distillate fraction of said fuel composition which is at least 175° F. and is also greater than a corresponding maximum boiling temperature of the Technical Enleanment Region associated with said distillate fraction.

12. A fuel composition comprising:

an unleaded hydrocarbon base fuel having an olefinic content;

a cyclopentadienyl manganese tricarbonyl antiknock compound having a manganese concentration from about 0.001 to about 1.0 gram of elemental manganese per gallon of said fuel composition;

a first oxygenate comprising selected from the group consisting of C_1 to C_6 aliphatic alcohols; and

a second oxygenate different from said first oxygenate and selected from the group consisting of C_2 to C_{12} alcohols, C_3 to C_{12} ketones, C_2 to C_{12} ethers, and mixtures thereof,

wherein a boiling temperature is associated with the T50 distillate fraction of said fuel composition which is at least 175° F. and is also greater than a corresponding maximum boiling temperature of the Technical Enleanment Region associated with said distillate fraction.

18. A fuel composition comprising:

an unleaded hydrocarbon base fuel having an olefinic content;

a cyclopentadienyl manganese tricarbonyl antiknock compound having a manganese concentration from about 0.001 to about 2.0 grams of elemental manganese per gallon of said fuel composition; and

an oxygenate selected from the group consisting of ethanol and methanol and mixtures thereof,

wherein a boiling temperature is associated with the T30 distillate fraction of said fuel composition which is at least 130° F. and is also greater than a corresponding maximum boiling temperature of the Technical Enleanment Region associated with said distillate fraction.

27. A method of minimizing technical enleanment, said method comprising the step of:

providing an fuel composition including (a) an unleaded hydrocarbon base fuel containing olefins, (b) a cyclopentadienyl manganese tricarbonyl antiknock compound having a manganese concentration from about 0.001 to about 1.0 gram of manganese per gallon of said fuel composition, and (c) an oxygenate selected from the group consisting of C_1 to C_6 aliphatic alcohols, C_2 to C_7 ethers, and mixtures thereof, wherein a boiling temperature is associated with the T50 distillate fraction of said fuel composition is at least 175° F. and is also greater than the maximum boiling temperature of the Technical Enleanment Region associated with said distillate fraction.

6,039,773

FUEL COMPOSITIONS CONTAINING POLYAMINES OF POLYALKYL AROMATIC ESTERS

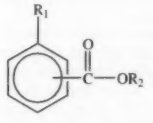
Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company LLC, San Francisco, Calif.

Filed Dec. 22, 1997, Appl. No. 995,596

Int. Cl.[7] **C10L** *1/18;1/22*

U.S. Cl. 44—399 **28 Claims**

1. A compound of the formula:



or a fuel-soluble salt thereof;

wherein R_1 is a polyamine moiety having about 2 to about 12 amine nitrogen atoms and about 2 to about 40 carbon atoms, wherein the polyamine moiety is connected to the aromatic ring through one of its amine nitrogen atoms; and

R_2 is a polyalkyl group having an average molecular weight in the range of about 450 to 5,000.

6,039,774

PYROLYTIC CONVERSION OF ORGANIC FEEDSTOCK AND WASTE

Frederick G. McMullen, P.O. Box 396, Gwynedd Valley, Pa. 19437; Dillon G. McMullen, N6640 County Hwy. H, and Roger B. McMullen, N5238 Hwy. 51, both of Irma, Wis. 54442

Division of application No. 08/255,326, Jun. 7, 1994, Pat. No. 5,589,599. This application Dec. 26, 1996, Appl. No. 774,185.

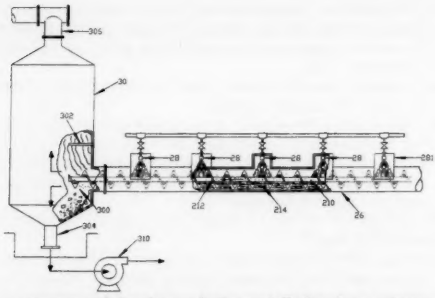
Int. Cl.[7] **C10G** *9/04;* **B01F** *3/02*

U.S. Cl. 48—102 A **12 Claims**

1. A modular flash pyrolysis type plant system to produce an activated carbon matrix product and a clean combustible gas product from an organic feedstock comprising:

at least one feedstock receiving unit to accept, hold and convey a feedstream of at least one solid organic feedstock;

a pair of insulated pyrolytic apparatus to receive contain, convey and convert the solid feedstock at approximately atmospheric



pressure and thereby producing and discharging a mixture of intermediate solid and gas products being both a solid activated carbon type product and a gaseous hydrocarbon type product, wherein said pyrolytic apparatus has at least one gas burner unit as a cavity radiator heat source to provide the heat of pyrolytic conversion;

a jacketed conveyor to accept, contain and convey the intermediate products from each one of the pyrolytic apparatus and allow the temperature of said intermediate products to be reduced by association with ambient air within a jacket around a covered and enclosed portion of the jacketed conveyor;

a spray water section unit to receive, contain, convey and convert the intermediate products from each one the jacketed conveyors, wherein a spray of water adjusts the relative amounts of steam, hydrogen, carbon dioxide and carbon monoxide in the intermediate products to provide an enhanced intermediate mixture of products being an enhanced gas mixture and a carbon slurry product when the flow rate of additional spray water is adjusted to further regulate the temperature of said feedstream;

at least one gas separator/scrubber to accept the carbon slurry and the enhanced gas mixture from the spray water sections, to divide the carbon slurry product from the enhanced gas mixture and to scrub the enhanced gas mixture such that the cooled total product stream is separated;

at least one gas mixture processing unit where the enhanced and scrubbed gas mixture is received from each gas scrubber unit to be processed for storage as a combustible gas mixture in a combustible gas storage unit as well as transported to at least one other energy producing unit of the plant including the pyrolytic apparatus for use as a combustible fuel in at least the pyrolytic apparatus cavity radiator burner units to help produce the heat for pyrolysis;

at least one air supply system including a blower and air duct piping to provide the oxygen for combustion of the combustible gas mixture in at least the pyrolytic apparatus burner units, said air duct piping for each pyrolytic apparatus burner unit being connected with an outer jacket on the jacketed conveyor to increase the temperature of the ambient air of combustion and thereby increase the thermal efficiency of the plant;

at least one dewatering assembly including a drain bin with a condenser, an inclined dewatering conveyor and a quench tank to receive and dewater the carbon slurry pumped from a lower outlet port of the gas scrubber unit, wherein a major portion of the water is removed from the carbon slurry and returned to at least the gas scrubber unit and the spray water section and a wet activated carbon product is produced; and

at least one regenerating apparatus to receive, contain, convey and convert the wet activated carbon product from at least one respective dewatering assembly, said regenerating apparatus having at least one cavity radiator portion being an outer jacket portion containing hot exhaust gases from the cavity radiator of another apparatus to radiate heat to and through regenerating retorts for further drying and pyrolysis of the activated carbon product thereby producing additional gaseous products and a dry enhanced activated carbon matrix, wherein the further gaseous products are discharged from the regenerating apparatus by a gas outlet pipe to the spray water section and the enhanced activated carbon matrix is discharged through a rotary valve at a carbon outlet port by an internal conveyor system including an auger, each said cavity radiator further having at least one exhaust port to discharge the hot exhaust gasses, whereas the enhanced activated carbon matrix and the combustible gas mixture is available for public use.

6,039,775

ABRASIVE ARTICLE CONTAINING A GRINDING AID AND METHOD OF MAKING THE SAME

Kwok-Lun Ho, Woodbury; Robert A. Follensbee, Cottage Grove; Walter L. Harmer, Arden Hills, and Mary L. Morris, White Bear Lake, all of Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Continuation-in-part of application No. 08/962,622, Nov. 3, 1997, abandoned. This application Oct. 6, 1998, Appl. No. 167,081.

Int. Cl.[7] B23D *3/34*

U.S. Cl. 51—295 **74 Claims**

1. An abrasive article comprising:

a backing having a first major surface and a second major surface;

a plurality of abrasive particles;

a make coat formed from a first binder precursor, wherein the make coat bonds the plurality of abrasive particles to the first major surface of the backing; and

a peripheral coating layer comprising a grinding aid formed from a mixture comprising an acid and at least one of:

(i) an inorganic metal phosphate salt selected from the group consisting of alkali metal phosphate salts and alkaline earth metal phosphate salts; or

(ii) an inorganic metal sulfate salt selected from the group consisting of alkali metal sulfate salts, alkaline earth metal sulfate salts and transition metal sulfate salts.

6,039,776

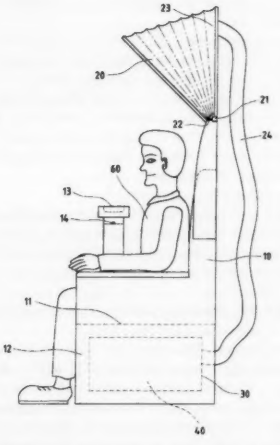
CLEANING DEVICE FOR AVOIDING DISSIPATION OF POLLUTED AIR DUE TO SMOKING

Yung-Ho Liue, Room 18, 13F, No. 4, Shi-Ning South Rd., and Kung-An Chiang, No. 1, Alley 32, Lane 76, Sec. 2, Ho-Ping E. Rd., both of Taipei, Taiwan

Filed Dec. 9, 1998, Appl. No. 208,252

Int. Cl.[7] B01D *53/00*

U.S. Cl. 55—385.1 **2 Claims**



1. A cleaning device for avoiding dissipation of polluted air due to smoking, comprising:

a chair body disposed with a seat pad board and formed with a chamber under the seat pad board, an ash tray being disposed

on an arm rest of the chair body, a sucking motor switch being disposed at a bottom of the ash tray;

a gas-collecting funnel connected with a top end of the chair body by a coupler, the funnel being extensibly downward pullable and openable, a main power switch being disposed on a chair back at an end of the downward pulling travel of the funnel, an end of the funnel being communicated with a sucking port which is communicated with a sucking device by a gas conduit;

a sucking device including a sucking motor, a check valve being disposed on a gas inlet side of the sucking motor, an expansion room being disposed on a rear side of the sucking motor, an expansion valve being disposed in the expansion room, an expansion valve switch being disposed on the expansion valve for switching on/off the power for the sucking motor; and

a filtering box disposed on a rear side of the sucking device and having a smaller gas inlet and a larger gas outlet, a filtering cotton and active carbon being disposed in the filtering box, whereby the sucking device and the filtering box are installed in the bottom of the chair body and a smoker sits on the chair body with the gas-collecting funnel pulled downward to restrain the waste smoke gas within the funnel, the sucking device sucking the polluted air through the gas conduit into the filtering box to be purified.

6,039,777

AIR FILTER DEVICE AND AN AUTOMOBILE HAVING THE SAME

Jeong-Ki Lee, Incheon, Rep. of Korea, assignor to Daewoo Motor Co, Ltd., Seoul, Rep. of Korea

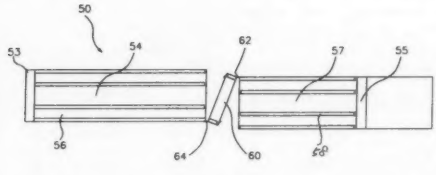
PCT No. PCT/KR96/00247, § 371 Date Jun. 19, 1998, § 102(e) Date Jun. 19, 1998, PCT Pub. No. WO97/23360, PCT Pub. Date Jul. 3, 1997

PCT Filed Dec. 26, 1996, Appl. No. 91,959

Claims priority, application Rep. of Korea, Dec. 26, 1995, 95-56097

Int. Cl.[7] **B01D** *46/10*

U.S. Cl. 55—385.3 **7 Claims**



1. An air filter device comprising:

an air filter member that is a single piece formed as a plurality of parallel creases;

a plurality of rigid frame members for containing an edge of said air filter member, said frame members having a pair of first frame members and a pair of second frame members; and

a pair of connecting frame members for connecting said frame members to allow for bidirectional bending of said air filter member by being hinged at opposite sides where said plurality of creases extend,

each of the connecting frame members having a corner area of one end connected to an end portion of said first frame member and a diagonal corner area of the other end connected to an end portion of said second frame member, and being substantially shaped as a rectangular side plane.

6,039,778

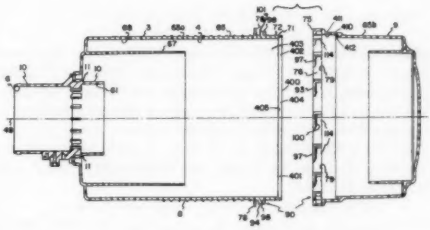
AIR CLEANER ASSEMBLY

Paul R. Coulonvaux, Brussels, Belgium, assignor to Donaldson Company, Inc., Minneapolis, Minn.

Continuation-in-part of application No. 08/928,684, Sep. 12, 1997. This application Sep. 3, 1998, Appl. No. 146,291.

Int. Cl.[7] **B01D** *46/24*

U.S. Cl. 55—498 **21 Claims**



1. An air cleaner assembly comprising:

(a) a body member including a sidewall and an end wall;

(i) said body member defining an open air cleaner interior and an air flow inlet;

(ii) said sidewall defining an open end for selected insertion and removal of an air filter element;

(iii) said body member including a generally cylindrical, cover engagement, surface;

(b) a removable cover sized for selective positioning in covering relation to said sidewall open end;

(i) said cover including a generally cylindrical, body member engagement, surface;

(ii) said body member engagement surface being dimensioned to circumscribe said cover engagement surface;

(c) a rotation activated lock assembly having a first unlocked orientation and a second locked orientation;

(i) said cover being separable from said body member when said lock assembly is in said first, unlocked, orientation;

(ii) said cover being secured to said body member when said lock assembly is in said locked orientation;

(iii) said rotation activated lock assembly being constructed and arranged to selectively move between said unlocked orientation and said locked orientation, by rotational movement of said cover relative to said body member;

(iv) said cover being selectively rotatably slideable relative to said body member, with said cylindrical cover-engagement surface opposed to said cylindrical body member engagement surface, during selected movement of said lock assembly between said locked and unlocked orientations;

(v) said rotation activated lock assembly including a holder arrangement; said holder arrangement comprising a first plurality of p-shaped holders, each having a tail extending generally perpendicular to a direction of rotation of said cover relative to said body member during locking;

(A) said body member being a molded plastic construction with said holders molded thereon and integrally therewith;

(vi) said rotation activated lock assembly including a second plurality of feet; said feet each including a banana shaped segment oriented to engage a selected one of said p-shaped holders during locking;

(A) said tail of each p-shaped holder extending sufficiently far to block rotation of said cover, relative to said body member, by engagement with a portion of a selected foot, beyond a selected amount of rotation, during locking;

(B) said cover being a molded plastic member with said feet molded thereon and integrally therewith; and

(d) a moveable engagement finger selectively positionable between engaged and release positions;

(i) said engagement finger, when in said engaged position, being positioned to secure a portion of a selected holder

between a portion of the engagement finger and a portion of a selected foot member to prevent rotational movement of the cover relative to the body member; and,

(ii) said engagement finger, when in said release position, releasing a selected holder to allow selected rotational movement of the cover relative to the body member.

6,039,779

FILTER ELEMENT

Thomas Butz, Korntal-Muenchingen; Ralf Kaller, Kornwestheim; Guenther Kissel, Stuttgart; Gehard Mayer, Pleidelsheim; Volker Koch, Stuttgart, and Werner Schnabel, Revenstein, all of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

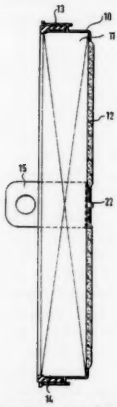
PCT No. PCT/EP96/03239, § 371 Date May 7, 1998, § 102(e) Date May 7, 1998, PCT Pub. No. WO97/10039, PCT Pub. Date Mar. 20, 1997

PCT Filed Jul. 23, 1996, Appl. No. 29,983

Claims priority, application Germany, Sep. 15, 1995, 195 34 254

Int. Cl.[7] **B01D** *46/52*

U.S. Cl. 55—499 **7 Claims**



1. A filter element comprising a pleated filter medium in the form of a flat plate secured in a surrounding frame, a plurality of support rods extending across the frame over a surface of the plate, at least one rod having at least one projecting segment extending into a fold of the pleated filter medium so that sides of the projecting segment abut the filter medium, and said projecting segment having at least one aperture therethrough which is filled with an adhesive to adhesively bond the projecting segment to said filter medium, whereby said filter medium is stabilized against vibrating, bucking or collapsing.

6,039,780

FILTER ARRANGEMENT

Karl Ernst Hummel, Bietigheim-Bissingen; Helmut Luka, Kornwestheim, and Bruno Sommer, Ludwigsburg, all of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

PCT No. PCT/EP96/05664, § 371 Date Sep. 2, 1998, § 102(e) Date Sep. 2, 1998, PCT Pub. No. WO97/23271, PCT Pub. Date Jul. 3, 1997

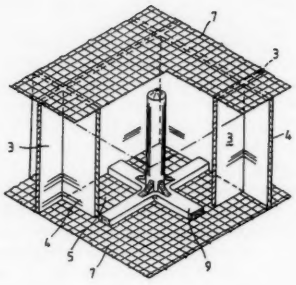
PCT Filed Dec. 17, 1996, Appl. No. 91,550

Claims priority, application Germany, Dec. 22, 1995, 195 48 180

Int. Cl.[7] **B01D** *39/02;* **B65D** *65/00*

U.S. Cl. 55—502 **16 Claims**

1. A filter arrangement comprising a cell structure comprising an outer frame and a plurality of intermediate partition walls disposed



within the cell frame at right angles to define a plurality of rectangular filter chambers extending in a flow direction of a medium which is to be filtered; first and second filter fabric layers arranged respectively on opposite end faces of the cell structure so as to close off both ends of the filter chambers, a filling comprised at least predominantly of active charcoal granules disposed in said filter chambers between the first and second filter fabric layers, and reinforcing elements for mechanically stabilizing the active charcoal granules disposed in the filter chambers, said reinforcing elements being secured to a layer of said filter fabric by a pin or rivet which passes through the filter fabric layer.

6,039,781

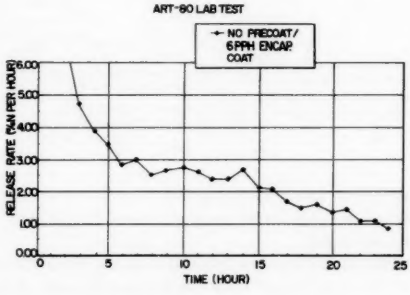
PRECOATED CONTROLLED RELEASE FERTILIZERS AND PROCESSES FOR THEIR PREPARATION

Harvey M. Goertz; Richard J. Timmons, both of Marysville, Ohio, and William R. Johnson, San Jose, Calif., assignors to OMS Investments, Inc., Wilmington, Del.

Filed Jun. 9, 1998, Appl. No. 94,329

Int. Cl.[7] **A01N** *25/00;25/08;25/10;* **C05C** *9/00*

U.S. Cl. 71—1 **35 Claims**



1. A controlled release fertilizer comprising:

a granular core of nutrient material;

a preliminary coating of an organic oil applied on the granular core; and,

a polymeric encapsulating coat applied over the preliminary coating on the granular core while the organic oil is uncured;

the preliminary coating being cured after application of the polymeric encapsulating coat.

6,039,782

PREPARING ORGANIC POWDER BY ANAEROBICALLY TREATING FERMENTATION WASTE FLUID AND AEROBICALLY TREATING THE DIGESTED FERMENTATION LIQUOR

Akio Sota, Kasukabe; Tomoo Okiura, and Masaki Azuma, both of Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1998, Appl. No. 8,296

Claims priority, application Japan, Jan. 29, 1997, 9-015181

Int. Cl.[7] C05F *11/08;1/00;7/00;* **C05B** *9/00;* **A01N** *25/00*

U.S. Cl. 71—10 **28 Claims**

1. A process for producing granulated organic matter comprising the steps of:

(a) obtaining a fermentation waste fluid;

(b) anaerobically fermenting said fermentation waste fluid to obtain a digested fermentation liquor;

(c) aerobically treating said digested fermentation liquor;

(d) subjecting the aerobically treated digested fermentation liquor to precipitation to obtain a precipitated fraction;

(e) drying or dehydrating the precipitated fraction;

(f) blending the dried or dehydrated precipitated fraction with a fermentation waste fluid which has not been aerobically treated; and

(g) granulating the blended fermentation waste fluid and precipitated fraction obtained from step (f).

6,039,783

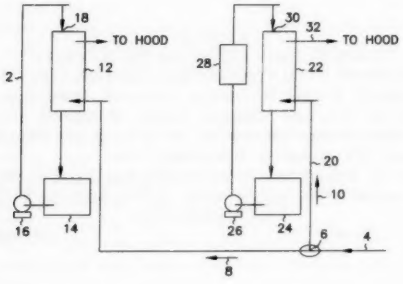
PROCESS AND EQUIPMENT FOR NITROGEN OXIDE WASTE CONVERSION TO FERTILIZER

Dale E. Lueck, Merritt Island, and Clyde F. Parrish, Melbourne, both of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 3, 1996, Appl. No. 772,057

Int. Cl.[7] C01B *21/48;* **C05C** *5/02*

U.S. Cl. 71—59 **20 Claims**



15. A process for converting vapor streams containing at least one oxide of nitrogen to a solution comprising potassium nitrate, comprising a) contacting said vapor stream with water to form a solution of oxy acid(s) of nitrogen, b) adding hydrogen peroxide to said solution of oxy acid(s) of nitrogen to form a hydrogen peroxide containing solution, c) sampling said hydrogen peroxide containing solution to determine the relative amount of hydrogen peroxide in said hydrogen peroxide containing solution, d) adding hydrogen peroxide to said hydrogen peroxide containing solution when said sampling determines there is less than an excess of hydrogen peroxide, and e) adding potassium hydroxide to said hydrogen peroxide containing solution to form the solution comprising potassium nitrate.

19. An apparatus for converting vapor streams containing at least one oxide of nitrogen therein to a liquid fertilizer composition comprising:

a) means for carrying a vapor stream containing at least one oxide of nitroaen to a first contact zone,

b) means for providing water to said first contact zone to form oxy acid(s) of nitrogen from said at least one oxide of nitrogen,

c) means for directing said acid(s) as a second stream to a second contact zone,

d) means for providing to said second stream hydrogen peroxide within said second contact zone to convert at least some of any oxy acid(s) of nitrogen other than in the nitrate form present within said second stream to nitrate ions,

e) means for sampling said stream within said second contact zone to determine the relative amount of hydrogen peroxide within said second contact zone,

f) means for adding a solution comprising potassium hydroxide to said second stream to maintain a pH between 5.0 and 11.0 within said second stream within said second contact zone to form a solution of potassium nitrate, and

g) means for removing said solution of potassium nitrate from said second contact zone.

6,039,784

IRON-BASED POWDER COMPOSITIONS CONTAINING GREEN STRENGTH ENHANCING LUBRICANTS

Sydney Luk, Lafayette Hill, Pa., assignor to Hoeganaes Corporation, Riverton, N.J.

Filed Mar. 12, 1997, Appl. No. 820,371

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B22F *1/00*

U.S. Cl. 75—231 **22 Claims**

1. An improved metallurgical powder composition having a polymeric material associated therewith, comprising:

(a) a major amount of a metal-based powder having a weight average particle size in the range of about 25–350 microns;

(b) a minor amount of a polymeric material associated with the metal-based powder, the polymeric material comprising polyetherimides, polyphenylene ethers, polyethersulfones, polycarbonates, polyethylene glycols, polyvinyl acetates, or polyvinyl alcohols; and

(c) a minor amount of a solid compaction lubricant comprising at least about 10 percent by weight of a solid, particulate polyether having the formula:

$$H—[O(CH_2)_q]_n—OH$$

where q is from about 1 to about 7, and n is selected such that the polyether has a weight average molecular weight between about 10,000 and about 4,000,000, wherein said polyether has a weight average particle size between about 25 and 150 microns.

6,039,785

MATERIAL FOR THE POWDER-METALLURGICAL PRODUCTION OF SHAPED PARTS, IN PARTICULAR VALVE SEAT RINGS OR VALVE GUIDES WITH HIGH RESISTANCE TO WEAR

Kirit Dalal, Radevormwald; Ekkehard Köhler, Wetter, both of Germany, and Anil V. Nadkarni, Chapel Hill, N.C., assignors to Bleistahl Produktions-GmbH & Co. KG, Wetter, Germany, and SCM Metal Products, Inc., Research Triangle Park, N.C.

PCT No. PCT/EP97/00837, § 371 Date Oct. 15, 1998, § 102(e) Date Oct. 15, 1998, PCT Pub. No. WO97/30808, PCT Pub. Date Aug. 28, 1997

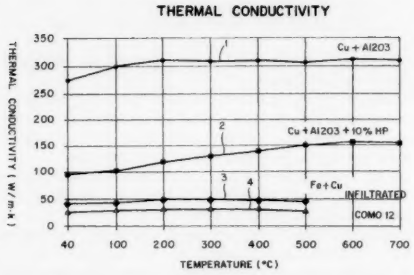
PCT Filed Feb. 21, 1997, Appl. No. 125,612

Claims priority, application Germany, Feb. 21, 1996, 196 06 270

Int. Cl.[7] C22C *1/05;9/00*

U.S. Cl. 75—235 **26 Claims**

1. A material for the powder-metallurgical production of shaped parts with high resistance to wear and corrosion and high thermal conductivity, in particular for the manufacture of valve seat rings or valve guides for internal combustion engines, by pressing,



sintering after-compacting of a starting powder mixture with a copper component of at least about 50% by weight, characterized in that the starting powder mixture consists of a basic powder in an amount of from 50% to 90% by weight, said powder containing the Cu-component, and a powdery molybdenum-containing alloying addition in an amount of from 10% to 50% by weight; and that the basic powder is a dispersion-hardened copper powder.

6,039,786

PROCESS FOR MELTING A METAL CHARGE IN A ROTARY FURNACE AND ROTARY FURNACE FOR IMPLEMENTING SUCH A PROCESS

Joan Marles Franco, Barcelona, Spain, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation de Procedes Georges Claude, Paris, France

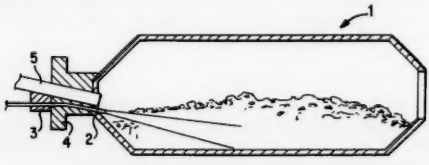
PCT No. PCT/FR95/00791, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO95/34791, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 15, 1995, Appl. No. 750,559

Claims priority, application Spain, Jun. 16, 1994, 9401366

Int. Cl.[7] C21C *1/08;* **F27B** *7/20*

U.S. Cl. 75—414 **17 Claims**



1. Process for melting a metal charge in a rotary furnace equipped with at least one oxygen burner, comprising the steps of:

(i) adding between 1.5 and 9% by weight based on the metal charge of a charge of solid fuel to the metal charge to form a combined charge; and

(ii) injecting at least one jet of oxygen in a direction of the combined charge in the furnace at an angle in a range from 5 to 25 degrees in relation to the axis of the furnace.

6,039,787

PROCESS FOR RECLAIMING COMBUSTION RESIDUES

Alfred Edlinger, Baden, Switzerland, assignor to "Holderbahk" Financiere Glarus AG, Glarus, Switzerland

PCT No. PCT/AT97/00201, § 371 Date May 15, 1998, § 102(e) Date May 15, 1998, PCT Pub. No. WO98/12359, PCT Pub. Date Mar. 26, 1998

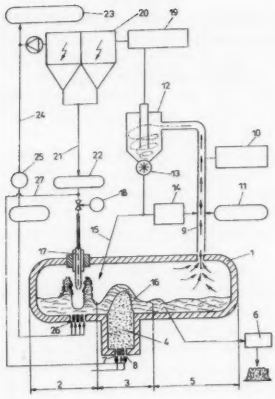
PCT Filed Sep. 12, 1997, Appl. No. 68,731

Claims priority, application Austria, Sep. 17, 1996, 549/96 U

Int. Cl.[7] C21C *5/30;5/32;5/34*

U.S. Cl. 75—531 **10 Claims**

1. A process for treating metallic residues from waste incineration plants and steel works in a converter having tuyeres, said process comprising:



providing molten slag in the converter at a layer height of more than 1.2 m, the molten slag containing the metallic residues;

reacting the molten slag with a metal bath contained in the converter while introducing an oxygen stream through the tuyeres submerged in the metal bath in an amount and at a temperature sufficient to cool the submerged tuyeres and adjust the metal bath to less than 1700° C. in temperature in the vicinity of the tuyeres, said reacting of the molten slag with the metal bath causing the metallic residues of the molten slag to be reduced and passed into the metal bath; and

injecting an inert gas containing carbon into the metal bath to adjust the reduction potential of the metal bath,

wherein the oxygen stream comprises oxygen, at least one member selected from the group consisting of CO_2 and water vapor, and optionally hydrocarbons.

6,039,788

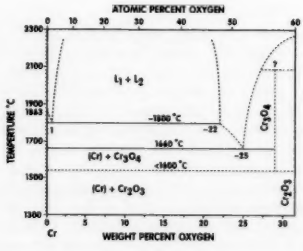
MELTING AND CASTING OF HIGH PURITY CHROMIUM WITH CONTROLLED OXYGEN CONTENT

Raymond K. F. Lam, Park Ridge; Charles E. Melin, Bogota, both of N.J., and Guiseppe Colella, Orangeburg, N.Y., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Division of application No. 08/822,055, Mar. 24, 1997, Pat. No. 5,866,067. This application Apr. 9, 1998, Appl. No. 57,932.

Int. Cl.[7] C22B *34/32*

U.S. Cl. 75—623 **16 Claims**



1. A method of manufacturing a high purity chromium ingot with controlled O content comprising the steps of:

providing a crucible;

charging said crucible with Cr;

adjusting the O level of the Cr to an elevated value between about 1000 and 6000 ppm by the addition of an oxide of chromium, wherein said elevated value is selected to reduce reaction between liquid Cr and the crucible;

heating said crucible to melt the Cr and the oxide of Cr; and casting an ingot from the melt.

6,039,789

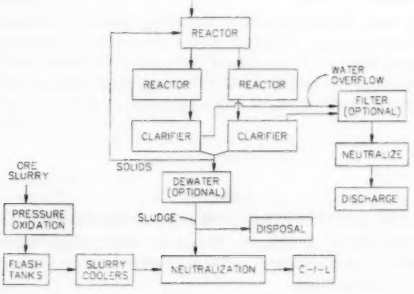
REMOVAL OF BORON AND FLUORIDE FROM WATER

Jacques McMullen, Toronto, Canada; Wilson Tsu, Elko, Nev., and Reinhard Kargel, Toronto, Canada, assignors to Barrick Gold Corporation, Ontario, Canada

Filed Mar. 27, 1998, Appl. No. 49,331

Int. Cl.[7] C22B *3/12*

U.S. Cl. 75—711 **7 Claims**



7. An integrated process for reducing boron and fluoride ion content of feed water, and recovering gold from a refractory auriferous ore containing sulfide sulfur, the process comprising:

contacting said feed water containing greater than 0.8 mg/L boron and greater than 1 mg/L fluoride ion at a temperature in the range of about 85° F. to about 130° F. with a source of magnesium in a dosage of between about 10 and about 80 mg magnesium per liter of feed water in the form of a magnesium sulfate in solution in a contacting zone;

contacting said feed water with a first lime slurry to produce treated water and a magnesium precipitate containing $3MgO.Mg(OH)_2.6SiO_2.6H_2O$, $Mg(OH)_2$, B, and F;

separating the treated water and precipitate into a substantially liquid fraction comprising water having a boron content below 0.7 mg/L and fluoride ion content below 0.9 mg/L and a substantially solid fraction comprising said magnesium precipitate;

transferring a first quantity of said solid fraction to the contacting zone to facilitate nucleation of said magnesium precipitate;

forming an aqueous ore slurry comprising said refractory auriferous ore;

subjecting the aqueous ore slurry to pressure oxidation in an autoclave to produce an oxidized ore slurry;

raising the pH of the oxidized ore slurry to between about 3 and about 4 by contacting said oxidized ore slurry with a second quantity of said substantially solid fraction comprising said magnesium precipitate to produce an intermediate oxidized slurry;

raising the pH of the intermediate oxidized slurry further to between about 10 and about 10.5 by contacting said intermediate oxidized slurry with a second lime slurry to produce a neutralized oxidized slurry; and

recovering gold from said neutralized oxidized slurry.

6,039,790

METHOD FOR RECOVERING NICKEL HYDROMETALLURGICALLY FROM TWO DIFFERENT NICKEL MATTES

Stig-Erik Hultholm, Pori, and Sigmund Peder Fugleberg, Turku, both of Finland, assignors to Outkumpu Technology Oy, Espoo, Finland

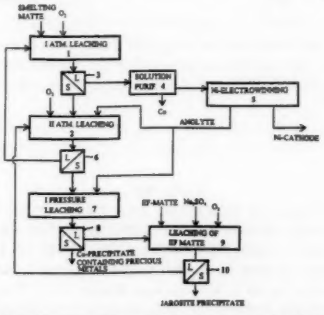
PCT No. PCT/FI96/00432, § 371 Date Feb. 5, 1998, § 102(e) Date Feb. 5, 1998, PCT Pub. No. WO97/07248, PCT Pub. Date Feb. 27, 1997

PCT Filed Aug. 6, 1996, Appl. No. 11,228

Claims priority, application Finland, Aug. 14, 1995, 953832

Int. Cl.[7] C21B *15/00*

U.S. Cl. 75—739 **18 Claims**



1. A method for recovering nickel and other valuable metals and for precipitating iron from first and second pyrometallurgically produced mattes, wherein the first matte contains a smaller proportion of iron than the second matte, comprising:

(a) leaching the first matte in a first leaching cycle including at least one atmospheric leaching step and at least one pressure leaching step each using a leaching solution containing nickel sulfate and sulfuric acid, whereby nickel of the first matte dissolves as nickel sulfate in each leaching step of the first leaching cycle and iron of the first matte dissolves in a leaching step of the first leaching cycle to form an iron-bearing solution,

(b) reducing nickel sulfate solution from the first leaching cycle to metallic nickel,

(c) leaching the second matte in a second leaching cycle using the iron-bearing solution formed in step (a) with pH adjusted to at least 1, whereby the nickel of the second matte dissolves as nickel sulfate, and

(d) using the nickel sulfate solution formed in step (c) as a leaching solution in a leaching step of the first leaching cycle.

6,039,791

FUSED CALCINED PETROLEUM COKE AND METHOD OF FORMATION

Michael G. Kazeef, 2000 Santiago Dr., Newport Beach, Calif. 92660, and Raymond Perruchoud, 3867 Vercorin, Roches-Hombes 5, Switzerland

Filed Oct. 23, 1997, Appl. No. 956,543

Int. Cl.[7] C22B *1/14;* **C10G** *9/00*

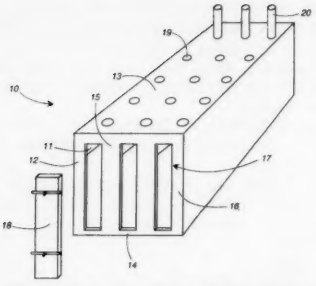
U.S. Cl. 75—764 **18 Claims**

1. A process for the production of anode grade coke comprised of the following steps:

(a) providing at least one granular green coke material to be calcined, said granular green coke material having a volatile carbonaceous materials content of greater than or equal to 16% by weight;

(b) positioning said at least one green coke material in a furnace; and

(c) heating said at least one green coke material in the furnace in the absence of air, under static conditions and controlled temperature and time, so as to reduce the volatile carbonaceous materials content and agglomerate of said granular



green coke material to an anode grade homogeneous coke product having a Real density (kg/dm3) within an accepted range of 1.95–2.10 and a grain stability (%) (8–4 mm) of 60–95.

6,039,792

METHODS OF FORMING AND USING POROUS STRUCTURES FOR ENERGY EFFICIENT SEPARATION OF LIGHT GASES BY CAPILLARY CONDENSATION

Narasimhan Calamur, Lemont; Martin E. Carrera, Naperville, both of Ill.; David J. Devlin, Los Alamos, and Tom Archuleta, Espanola, both of N. Mex., assignors to Regents of the University of California and BP Amoco Corporation, Chicago, Ill.

Continuation-in-part of application No. 08/881,711, Jun. 24, 1997, abandoned, Provisional application No. 60/050,714, Jun. 24, 1997. This application Jun. 22, 1998, Appl. No. 102,234.

Int. Cl.[7] **B01D** *53/22*

U.S. Cl. 95—45 **22 Claims**

1. A method for separating one or more condensable compounds from a gaseous mixture of two or more compounds of differing volatilities, comprising:

(a) providing a composite porous structure prepared by depositing a coating to one side of a substrate having a defined pore structure, to obtain a composite having a tapered pore structure characterized as tapering from openings of a large dimension at an opposing side of the substrate to smaller openings at the coated side;

(b) priming the pore structure with a liquid solvent;

(c) contacting, under condensing conditions, the coated side of the composite porous structure with a gaseous mixture comprising vapors of a more volatile component and a less volatile component whereby vapors from the mixture are permitted to condense, at least in part, substantially in and adjacent to the openings at the coated side, and to flow in a condensed liquid state, substantially in the absence of vapor, from the openings at the coated side to the openings at the opposing side; and

(d) maintaining conditions of a gaseous sweep adjacent the opposing side of the composite porous structure, whereby the liquid condensate in and adjacent to the openings at the opposing side is caused to evaporate.

6,039,793

INKS FOR INK JET PRINTING WITH REDUCED INTERCOLOR BLEED

Kurt B. Gundlach; Luis A. Sanchez, both of Fairport; Richard L. Colt, and Maura A. Sweeney, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1998, Appl. No. 105,606

Int. Cl.[7] **C09D** *11/02*

U.S. Cl. 106—31.28 **20 Claims**

1. A set of inks for generating multicolored images which comprises (a) a first ink having a first color, said first ink comprising water, a colorant, and a monomeric zwitterionic compound which is an amino acid, a betaine, or a mixture thereof, said first ink being substantially free of organic acids having no basic functional groups thereon; and (b) a second ink having a second color darker than the first color of the first ink, said second ink comprising water and a pigment; wherein intercolor bleed between the first ink and the second ink is reduced in visibility.

6,039,794

ANTHRAQUINONE COLORANTS FOR PHASE CHANGE INKS

Donald R. Titterington, Tualatin, and Jeffery H. Banning, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Jan. 22, 1999, Appl. No. 235,899

Int. Cl.[7] **C09D** *11/00*

U.S. Cl. 106—31.29 **7 Claims**

1. A phase change ink composition comprising the combination of at least one phase change ink carrier component and a compatible phase change ink colorant that comprises the reaction product of at least one oxy-substituted- 9,10-anthraquinone compound with at least one mono-functional amine compound.

6,039,795

INK COMPOSITION FOR OIL MARKING PEN

Hidetoshi Fukuo, Osaka, and Masakazu Yokoi, Higashiosaka, both of Japan, assignors to Sakura Color Products Corporation, Osaka, Japan

Filed Dec. 8, 1997, Appl. No. 986,640

Claims priority, application Japan, Dec. 10, 1996, 9-351938; Jul. 4, 1997, 9-194990

Int. Cl.[7] **C09D** *11/00*

U.S. Cl. 106—31.58 **19 Claims**

1. An ink composition for an oil marking pen, comprising an organic polar solvent containing a coloring agent soluble and dissolved in said organic polar solvent, a resin soluble and dissolved in said organic polar solvent and a silicone having organic groups attached to Si atoms, wherein said silicone is a polyether-modified silicone which includes polyoxypropylene in a proportion of 50% by weight or greater of the polyoxypropylene portion relative to the overall polyether portion and which has a number average molecular weight of 1,000 to 60,000, and said organic polar solvent is contained in a proportion of from about 50% by weight to about 96% by weight relative to the overall ink composition.

6,039,796

INK JET RECORDING INK AND METHOD

Kazuhide Kubota, and Toshiyuki Miyabayashi, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo-To, Japan

Filed Jun. 26, 1998, Appl. No. 105,912

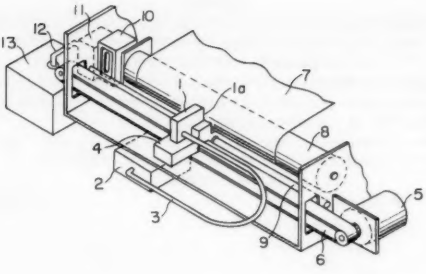
Claims priority, application Japan, Jun. 26, 1997, 9-170203; Jun. 26, 1997, 9-170204

Int. Cl.[7] **C09D** *11/00*

U.S. Cl. 106—31.6 **25 Claims**

1. An ink jet recording method, comprising the step of positing a reaction solution and an ink composition onto a recording medium to perform printing,

the reaction solution comprising a polyvalent metal salt, polyallylamine, or a derivative of the polyallylamine,



the ink composition comprising a colorant, an inorganic oxide colloid, and an aqueous solvent and having a pH value of not less than 9.

6,039,797

WASHABLE MARKING COMPOSITION

David C. Fistner, Sr., Bethlehem, Pa., assignor to Binney & Smith Inc., Easton, Pa.

Filed Feb. 1, 1999, Appl. No. 240,622

Int. Cl.[7] **C09D** *11/00*

U.S. Cl. 106—31.64 **26 Claims**

1. A washable marking composition comprising an alkoxylated fatty acid, a fatty alcohol, and a pigment.

6,039,798

SILICA PRODUCTS AND UV CURABLE SYSTEMS

Derek Aldcroft, South Wirral; Sharron Bates, Sandbach, and Graham James Earl, Winsford, all of United Kingdom, assignors to Crosfield Limited, United Kingdom

PCT No. PCT/EP96/03246, § 371 Date Feb. 12, 1999, § 102(e) Date Feb. 12, 1999, PCT Pub. No. WO97/08250, PCT Pub. Date Mar. 6, 1997

PCT Filed Jul. 20, 1996, Appl. No. 29,416

Claims priority, application United Kingdom, Aug. 29, 1995, 9517607

Int. Cl.[7] **C08L** *91/06;* **C09D** *1/02;* **C08K** *9/00;* **C08J** *3/28*

U.S. Cl. 106—272 **12 Claims**

1. A wax is one having a melting point of less than 85° C. and coated silica matting agent in which the silica is an amorphous silica and the wax is a synthetic polyethylene wax, characterised in that the silica has a pore volume of at least 1.5 cm^3/mg and the wax is present in an amount up to 15% by weight of the matting agent, the pore volume and wax content being such that a matting efficiency of less than 57 gloss units at an incidence angle of 60° is obtained when the wax coated silica is incorporated in an amount of 5.4% by weight in a urethane acrylate formulation defined herein as Formulation 2.

6,039,799

PAPER COATING COMPOSITION

Akira Kawamura, Toyonaka; Toshiyuki Hasegawa, Nara, and Akira Tanikawa, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Aug. 25, 1998, Appl. No. 139,638

Claims priority, application Japan, Aug. 26, 1997, 9-229264; Aug. 4, 1998, 10-220667

Int. Cl.[7] **C09D** *7/12;201/00*

U.S. Cl. 106—287.2 **8 Claims**

1. A paper coating composition which comprises:

(I) a pigment,

(II) an aqueous binder, and

(III) a crosslinked amine compound obtainable by reacting a heterocyclic amine (a) and a glycidyl compound (b) having at least two glycidyl groups in the molecule.

6,039,800

PRODUCTION OF FOAMED COMPOSITIONS CONTAINING GYPSUM

Mojahedul Islam, Powell, Ohio, assignor to Witco Corporation, Greenwich, Conn.

Filed May 14, 1998, Appl. No. 78,959

Int. Cl.[7] **C04B** *38/10;24/12;11/00*

U.S. Cl. 106—680 **23 Claims**

1. A process for making a foamed gypsum composition, comprising:

(I) combining water and one or more surfactants selected from the group consisting of amphoteric surfactants of formula (a) or (b)

$$R^4—(OC_3H_6)_x—(C(O)NH(CH_2)_{1-3})_y—N(Z^1)(Z^2)_{0-1}—ZCOOX \quad (a)$$

$$R^4—(OC_3H_6)_x—(C(O)NH(CH_2)_{1-3})_y—N(Z^1)(Z^2)_{0-1}ZSO_3X \quad (b)$$

wherein

X is —H, a sodium, calcium, potassium, lithium or ammonium cation, or an amine of the formula $—N^+H(C_{1-20}\ alkyl)_2$ or N^+H_2 (C_{1-20} alkyl); or when a Z^2 group is present there is no X group on —ZCOOX;

R^4 is straight or branched alkyl or alkylene, or cyclic or heterocyclic aromatic which is optionally substituted with alkyl, and contains 4 to 40 carbon atoms and 0–5 carbon-carbon double bonds;

x is 0–1, y is 0–1, and x+y is 0–1;

Z^1 and Z^2 are independently of each other H, C_fH_{2f+1}, or $C_fH_{2f}OH$ wherein f is 1 to 6 or, in formula (a), one of Z^1 and Z^2 may further be —ZCOOX, where Z is $(CH_2)_f$, $CH_2CH_2OCH_2CH_2$ or $CH_2CHOHCH_2$; and

(II) foaming the resulting combination, provided that either:

(A) the water in step (I) contains calcined gypsum slurried therein, and step II is carried out during or after step (I), or

(B) the process during or after step (II) further comprises an additional step (III) of combining the product of step (II) and an aqueous slurry of calcined gypsum.

6,039,801

CONTINUOUS OXIDATION PROCESS FOR CRYSTAL PULLING APPARATUS

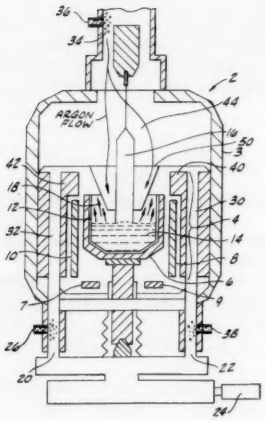
John D. Holder, and Bayard K. Johnson, both of Lake St. Louis, Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Oct. 7, 1998, Appl. No. 167,747

Int. Cl.[7] **C30B** *15/00*

U.S. Cl. 117—20 **26 Claims**

1. A process for reducing the amount of hypostoichiometric silicon dioxide in a crystal pulling apparatus through continuous oxidation of silicon compounds produced during production of silicon ingots by the Czochralski method in a crystal pulling apparatus, the process comprising continuously injecting an argon gas stream into the apparatus above a hot zone within the apparatus during ingot growth such that the argon gas stream flows downwardly within the apparatus through the hot zone and into an exhaust tunnel and continuously injecting an oxygen-containing gas through an inlet in the exhaust tunnel in the apparatus at a



position downstream from the hot zone relative to the direction of flow of the argon gas stream to continuously oxidize silicon monoxide, silicon vapor, and hypostoichiometric silicon dioxide produced during the production of the silicon ingot.

6,039,802

SINGLE CRYSTAL GROWTH METHOD

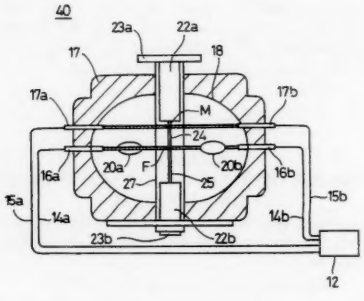
Takenori Sekijima, Shiga-ken; Takashi Fujii, Otsu; Kikuo Wakino, Muko, and Masakatsu Okada, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 5, 1998, Appl. No. 35,472

Claims priority, application Japan, Mar. 12, 1997, 9-078977

Int. Cl.[7] C30B *13/02*

U.S. Cl. 117—49 **20 Claims**



1. A single crystal growth method comprising the steps of:

providing an incongruent melting polycrystal having a first and a second end, and a single crystal seed crystal joined to the first end thereof;

heating a portion of the polycrystal distant from the first end so as to form a melt zone at that portion of the polycrystal;

moving the melt zone toward the first end of the polycrystal so as to contact the seed crystal; and

growing single crystal by moving the melt zone toward the second end of the polycrystal.

6,039,803

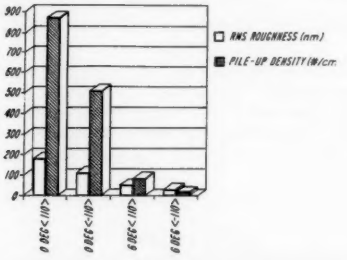
UTILIZATION OF MISCUT SUBSTRATES TO IMPROVE RELAXED GRADED SILICON-GERMANIUM AND GERMANIUM LAYERS ON SILICON

Eugene A. Fitzgerald, Windham, N.H., and Srikanth B. Samavedam, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Provisional application No. 60/020,820, Jun. 28, 1996. This application Feb. 27, 1997, Appl. No. 806,741.

Int. Cl.[7] C30B *25/18*

U.S. Cl. 117—89 **13 Claims**



1. A method of processing semiconductor materials, comprising:

providing a monocrystalline substrate of a first semiconductor material having an orientation from 1° to about 8° offset from the [001] direction; and

epitaxially growing a relaxed graded layer of a crystalline second semiconductor material on said substrate, said second semiconductor material including at least said first semiconductor material, and thus forming a semiconductor surface of the relaxed graded layer that has a dislocation pile-up density less than 60 per centimeter, and a threading dislocation density lower than 3×10^6 cm^{-2} and a root-mean square surface roughness of less than 20 nm.

6,039,804

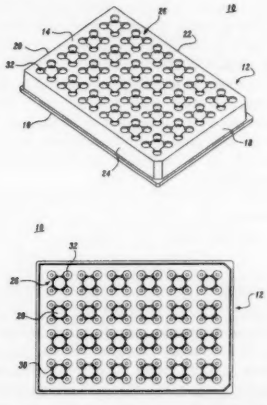
CRYSTALLIZATION TRAY

Hidong Kim, and Lansing Joseph Stewart, both of Bainbridge Island, Wash., assignors to Emerald BioStructures, Inc., Bainbridge Island, Wash.

Filed Sep. 9, 1998, Appl. No. 150,629

Int. Cl.[7] C30B *35/00*

U.S. Cl. 117—206 **22 Claims**



17. A crystallization tray comprising a plurality of crystallization units, each of said crystallization units comprising a reservoir, four drop chambers disposed around said reservoir, and four diffusion channels that connect said drop chambers to said reservoir.

6,039,805

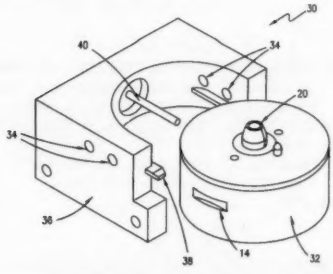
TRANSFER FLUXING METHOD AND APPARATUS FOR COMPONENT PLACEMENT ON SUBSTRATE

John Gillette Davis; Allen Thomas Mays, and Kris Allen Slesinger, all of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1998, Appl. No. 5,539

Int. Cl.[7] B05C *1/02;* **B23K** *31/02*

U.S. Cl. 118—74 **11 Claims**



1. A transfer fluxing apparatus comprising: a flux reservoir containing flux; a compliant pad attached to an opening in the flux reservoir; a means for controlling deposition of flux onto the compliant pad; and further means for refilling the flux reservoir with flux, said refilling means comprising a refill device extending through a wall of the flux reservoir.

6,039,806

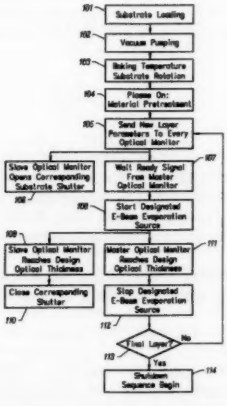
PRECISION THICKNESS OPTICAL COATING SYSTEM AND METHOD OF OPERATION THEREOF

Ming Zhou; Feng Qing Zhou, both of San Jose, and Jing-Jong Pan, Milpitas, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Apr. 20, 1998, Appl. No. 63,147

Int. Cl.[7] C23C *14/30;14/34;16/48;16/52*

U.S. Cl. 118—665 **31 Claims**



1. A high-volume apparatus for precision coating substrates to form optical elements, said system comprising:

a vacuum chamber;

at least one optical coating material source for generating coating material vapor for deposition;

a plurality of stations, each station holding and rotating a substrate to receive said optical coating material by deposition of said coating material vapor from said optical coating material source; and

a plurality of optical monitoring units, each optical monitoring unit corresponding to one of said stations for monitoring said deposition of said coating material upon said corresponding substrate.

6,039,807

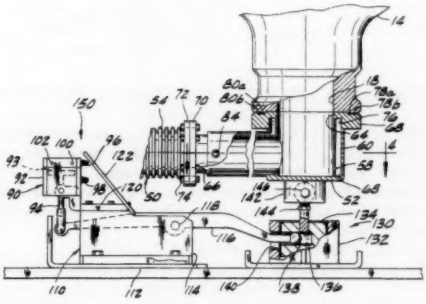
APPARATUS FOR MOVING EXHAUST TUBE OF BARREL REACTOR

Umberto Guarniero, Novara; Franco Magon, Trecate, and Enzo Bonanno, Novara, all of Italy, assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Mar. 17, 1998, Appl. No. 40,123

Int. Cl.[7] C23C *16/00*

U.S. Cl. 118—715 **18 Claims**



1. An epitaxial barrel reactor for depositing a material on a semiconductor wafer by a chemical vapor deposition process using a reactant gas, said barrel reactor comprising:

a receptacle defining a reaction chamber sized to receive at least one semiconductor wafer, said receptacle having an inlet port for introducing reactant gas to said reaction chamber and an exhaust port for removing reactant gas from said reaction chamber;

an exhaust tube sealingly engageable with the exhaust port of the receptacle for transporting reactant gas to facility piping to remove said gas from the reaction chamber after the chemical vapor deposition process;

an actuator spaced from the receptacle for moving the exhaust tube between an operating position in which the tube sealingly engages the exhaust port of the receptacle and a maintenance position in which the tube is spaced from the exhaust port to provide access to the receptacle; and

a mechanism operatively connected between the exhaust tube and the actuator for transmitting motion from the actuator to the exhaust tube to move the tube between said operating position and said maintenance position.

6,039,808

CVD APPARATUS FOR CU FORMATION

Yoshihiko Toyoda; Tetsuo Fukada; Takeshi Mori, and Makiko Hasegawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

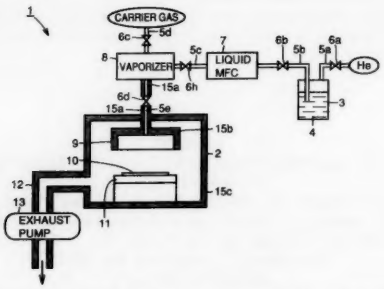
Filed Mar. 17, 1998, Appl. No. 42,693

Claims priority, application Japan, Mar. 18, 1997, 9-064232

Int. Cl.[7] C23C *16/06;16/18*

U.S. Cl. 118—715 **5 Claims**

1. A CVD apparatus for depositing Cu, the CVD apparatus comprising a source container containing a mixture of a solvent and a liquid raw material including Cu hexafluoroacetylacetonate (HFA) and adducted molecules, or a solid raw material including Cu(HFA) and adducted molecules, wherein at least one component of the CVD apparatus has a surface with a fluorinated organic



polymer, a fluorinated metal, an insulator or a Ti compound thereon at a portion where said raw material exists.

6,039,809

METHOD AND APPARATUS FOR FEEDING A GAS FOR EPITAXIAL GROWTH

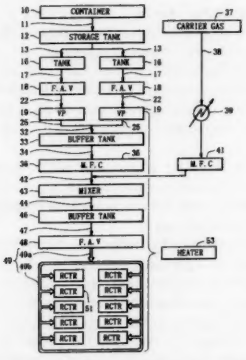
Yoshiharu Toyama; Akikazu Kuroda; Tokuji Kiyama; Sumio Kida; Shunji Yoshida, all of Tokyo; Takashi Yamamoto, and Tetsuya Atsumi, both of Mie, all of Japan, assignors to Mitsubishi Materials Silicon Corporation, Tokyo, and Mitsubishi Materials Polycrystalline Silicon Corporation, Mie, both of Japan

Filed May 28, 1998, Appl. No. 85,750

Claims priority, application Japan, Jan. 27, 1998, 10-014420

Int. Cl.[7] C23C *16/00*

U.S. Cl. 118—715 **5 Claims**



1. An apparatus for feeding a gas for epitaxial growth, comprising:

a vaporizer for heating a liquid raw material to vaporize the liquid raw material by water having a temperature of the liquid raw material's boiling point or higher,

a first mass flow controller for controlling a vaporized ingredient gas at the vaporizer to have a first predetermined mass flow,

a second mass flow controller for controlling a carrier gas to have a second predetermined mass flow,

a mixer for mixing the ingredient gas and the carrier gas controlled into the respective first and second predetermined mass flows,

a first flow adjusting valve for adjusting the flowing amount of the mixed gas composed of the ingredient gas and the carrier gas,

a tube for feeding the flow-adjusted mixed gas into a reactor for epitaxial growth,

a means for heating the ingredient gas and the mixed gas to over the respective condensing points for the ingredient gas and the mixed gas and maintaining the ingredient gas and the mixed gas at a temperature above the respective condensing points between the ingredient gas feeding tube of the vaporizer and the flow-adjusted mixed gas feeding tube for the reactor,

a pressure sensor for measuring a pressure of the ingredient gas inside the vaporizer,

a second flow adjusting valve for adjusting the feeding amount of the liquid raw material into the vaporizer, and

a controller for controlling the second flow adjusting valve on the basis of pressure measured by the pressure sensor.

6,039,810

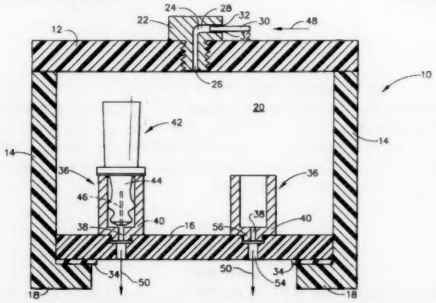
HIGH TEMPERATURE VAPOR COATING CONTAINER

Thomas E. Mantkowski, Madeira; Nripendra N. Das, West Chester; Raymond W. Heidorn, Fairfield, and Jackie L. King, Franklin, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 13, 1998, Appl. No. 191,660

Int. Cl.[7] C23C *16/00*; **F16L** *25/00*

U.S. Cl. 118—715 **7 Claims**



1. A high temperature vapor coating container including a container hollow interior, means to provide a coating vapor within the hollow interior, and means to hold at least one workpiece within the hollow interior; wherein:

the container is made of a nonmetallic material which:

a) has a coefficient of thermal expansion of less than about 4.5×10^{-6} at a vapor coating temperature of at least about 1700° F. to enable the container to resist distortion and cracking at the vapor coating temperature; and,

b) is nonreactive with the coating vapor at the coating temperature.

6,039,811

APPARATUS FOR FABRICATING POLYSILICON FILM FOR SEMICONDUCTOR DEVICE

Young-wook Park, Suwon; Cha-young Yoo; Young-sun Kim, both of Yongin, and Seung-hee Nam, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 9, 1997, Appl. No. 871,452

Claims priority, application Rep. of Korea, Jun. 8, 1996, 96-20441

Int. Cl.[7] C23C *16/00*

U.S. Cl. 118—719 **6 Claims**

1. A semiconductor device fabricating apparatus, comprising:

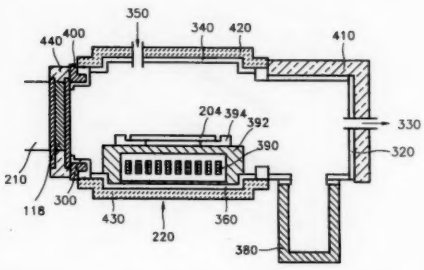
a cassette chamber for loading a semiconductor wafer;

a wafer transfer chamber having a front portion connected to the cassette chamber;

a reaction chamber connected to a rear portion of the wafer transfer chamber;

a gate valve disposed between the reaction chamber and the wafer transfer chamber to separate the reaction chamber from the wafer transfer chamber; and

first, second, third, fourth and fifth cooling units respectively mounted on a first wall of the reaction chamber adjacent to the wafer transfer chamber, a second side wall of the reaction



chamber opposite to the first side wall, an upper wall of the reaction chamber, a bottom wall of the reaction chamber; and on said gate valve.

6,039,812

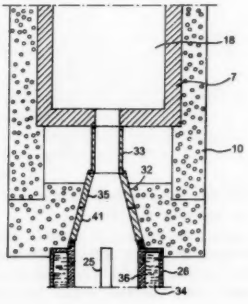
DEVICE FOR EPITAXIALLY GROWING OBJECTS AND METHOD FOR SUCH A GROWTH

Alex Ellison, Linkoping; Olle Kordina, Sturefors; Chun-Yuan Gu, Vasteras; Christer Hallin, Linkoping; Erik Janzen, Borensberg, and Marko Tuominen, Linkoping, all of Sweden, assignors to ABB Research Ltd., Zurich, Switzerland, and Okmetic Ltd., Espo, Finland

Continuation-in-part of application No. 08/735,402, Oct. 21, 1996, abandoned. This application Oct. 28, 1997, Appl. No. 959,191.

Int. Cl.[7] C23C *16/00;* **C30B** *29/36*

U.S. Cl. 118—725 **17 Claims**



1. A device for epitaxially growing objects on a substrate by chemical vapor deposition, the device comprising:

a susceptor having circumferential walls surrounding a room which receives said substrate;

a feeder for providing a flow of at least a carrier gas and a reactive gas into said susceptor and including:

a first conduit emerging into said room; and

a second conduit received in said first conduit, said second conduit having a smaller cross-section than said first conduit and extending in a longitudinal direction of said first conduit with a circumferential space separating said second conduit from inner walls of said first conduit, said first conduit conducting substantially only a carrier gas and said second conduit conducting only substantially reactive gases, said second conduit ending in said first conduit at a distance from said room, said first conduit having an enlarged cross-section in a region where said second conduit ends which decreases in the direction of said room;

a heater for heating said circumferential walls and thereby heating said substrate and said reactive gasses above a temperature level from which said reactive gases decompose on said substrate.

6,039,813

FRUCTOSE-BASED GRANULATED PRODUCT AND A PROCESS FOR THE PRODUCTION THEREOF

Tammy Pepper, Twickenham, United Kingdom; Christof Krüger, Hamburg, Germany, and Matti Mäkelä, Kirkkonummi, Finland, assignors to Xyrofin OY, Kotka, Finland

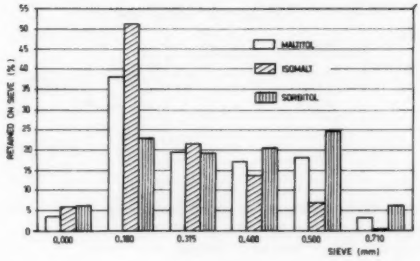
PCT No. PCT/FI90/00152, § 371 Date Jan. 15, 1992, § 102(e) Date Jan. 15, 1992, PCT Pub. No. WO90/14821, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 5, 1990, Appl. No. 777,347

Claims priority, application Finland, Jun. 7, 1997, 89/2797

Int. Cl.[7] B29C *1/04*

U.S. Cl. 127—42 **35 Claims**



1. A predominantly fructose-based granulated product suitable for use in the manufacture of tablets by direct compression means, comprising free-flowing granules comprising about 92% to about 98% by weight of fiuctose, about 1% to about 7% by weight of at least one of a physiologically acceptable polyol selected from the group consisting of sorbitol, maltitol, lactitol, xylitol, mannitol and isomalt and less than about 1% by weight of water, wherein the granulated product is produced while bringing fructose particles to a rapid movement in air.

6,039,814

CLEANING METHOD UTILIZING DEGASSED CLEANING LIQUID WITH APPLIED ULTRASONICS

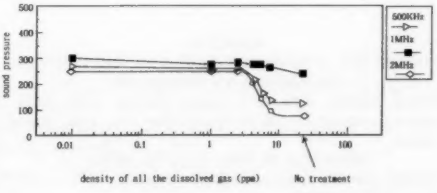
Tadahiro Ohmi, Miyagi-ken, and Takahisa Nitta, Tokyo, both of Japan, assignors to Tadahiro Ohmi, Miyagi, and Kabushiki Kaiha Ultraclean Technology Research Institute, Tokyo, both of Japan

Filed Jul. 3, 1997, Appl. No. 887,883

Claims priority, application Japan, Jul. 4, 1996, 8-175297

Int. Cl.[7] B08B *3/12*

U.S. Cl. 134—1 **4 Claims**



1. A method of cleaning semiconductors, comprising the steps of:

degassing gas dissolved in a cleaning liquid therefrom to a value not more than 5 ppm;

loading ultrasonics with a frequency of 1 MHz or more to said cleaning liquid; and

cleaning the semiconductors with said cleaning liquid.

6,039,815

CLEANING METHOD AND APPARATUS FOR THE SAME

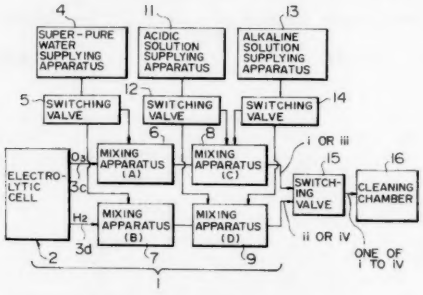
Oh Eui Yeol; Kenichi Mitsumori, and Satoshi Miyazawa, all of Miyagi-ken, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 26, 1997, Appl. No. 829,701

Claims priority, application Japan, Mar. 27, 1996, 8-072175

Int. Cl.[7] **C03C** *23/00;* **B08B** *3/00*

U.S. Cl. 134—2 **7 Claims**



1. A method for cleaning an object comprising:

providing a cleaning apparatus comprising:

a device for forming an ozone gas;

a device for forming a hydrogen gas;

a mixing device for dissolving said ozone gas into pure water to produce ozone water;

a mixing device for dissolving said hydrogen gas into pure water to produce hydrogen water;

a mixing device for mixing one of a group consisting of an acidic solution and an alkaline solution with said ozone water to obtain an oxidizing cleaning solution;

a mixing device for mixing one of a group consisting of an acidic solution and an alkaline solution with said hydrogen water to obtain a reducing cleaning solution;

means for supplying at least one of said cleaning solutions to a subject to be cleaned;

producing said ozone gas and said hydrogen gas;

dissolving at least one of said ozone gas and said hydrogen gas into pure water to produce at least one of ozone water and hydrogen water;

selectively mixing at least one of said ozone water and said hydrogen water with at least one of the acidic solution and alkaline solution to produce at least one cleaning solution selected from the group consisting of an oxidizing acidic cleaning solution, an oxidizing alkaline cleaning solution, a reducing acidic cleaning solution, and a reducing alkaline cleaning solution; and

cleaning the subject by supplying said at least one of said cleaning solutions to the subject.

6,039,816

OZONIZER, WATER PURIFIER AND METHOD OF CLEANING AN OZONIZER

Naotoshi Morita, Gifu, and Sachio Wakita, Aichi, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

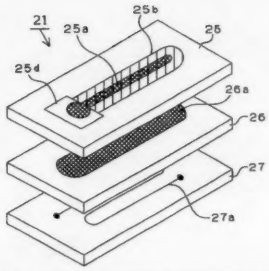
Filed May 28, 1998, Appl. No. 85,102

Claims priority, application Japan, Jun. 12, 1997, 9-171137; Nov. 4, 1997, 9-318987

Int. Cl.[7] **B08B** *7/02;* **B01J** *19/08*

U.S. Cl. 134—19 **13 Claims**

12. A method of cleaning an ozonizer having a discharge element for generating ozone by discharge in air containing ammonia, wherein said discharge produces nitrogen oxides which react with ammonia present in the air to produce ammonium nitrate adhering to said discharge element, which comprises heating said discharge element to a predetermined temperature within a range of from



200° C. to 500° C. so as to evaporate ammonium nitrate adhering to said discharge element.

6,039,817

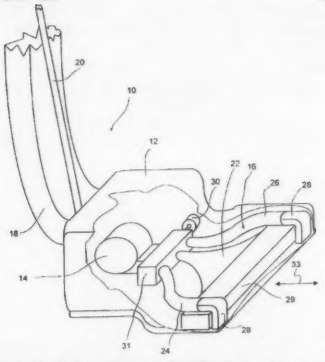
EDGE AND SPOT CLEANING SYSTEM FOR VACUUM CLEANERS

Thomas S. Payne, 32205 Allison Dr., Union City, Calif. 94587

Filed Jun. 30, 1998, Appl. No. 107,247

Int. Cl.[7] **A47L** *9/02;* **B08B** *5/04*

U.S. Cl. 134—21 **24 Claims**



18. A method of cleaning a surface having a corner area with a vacuum cleaner, comprising the steps of:

(1) directing suction by means of a valve assembly from a suction generating device of the vacuum cleaner to a main suction inlet area that spans a portion of the underside of a cleaning head of the vacuum cleaner, to clean the surface away from the corner area,

(2) directing suction by means of the valve assembly to a side suction inlet area that is adjacent a side edge of the cleaning head, to clean the surface along the corner area and

(3) providing an indicator to signal that there is suction in the side suction inlet area.

6,039,818

GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET AND PROCESS FOR PRODUCING THE SAME

Tetsuo Toge; Michiro Komatsubara; Atsuhito Honda; Kenichi Sadahiro, and Kunihiro Senda, all of Okayama, Japan, assignors to Kawasaki Steel Corporation, Japan

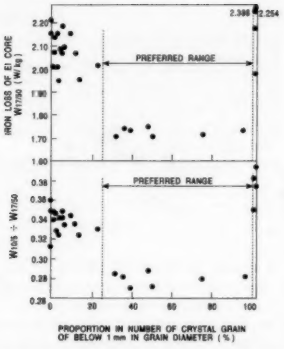
Filed Oct. 20, 1997, Appl. No. 954,504

Claims priority, application Japan, Oct. 21, 1996, 8-278136; Oct. 29, 1996, 8-286720; Nov. 8, 1996, 8-313098

Int. Cl.[7] **H01F** *1/18*

U.S. Cl. 148—307 **2 Claims**

1. A grain-oriented electromagnetic steel sheet having a low ratio of iron loss in a weaker magnetic field to iron loss in a stronger magnetic field, which steel sheet comprises:


IRON LOSS OF EI CORE W17/50 (W/kg)
PREFERRED RANGE
PREFERRED RANGE
W10/5 ÷ W17/50
PROPORTION IN NUMBER OF CRYSTAL GRAIN OF BELOW 1 mm IN GRAIN DIAMETER (%)

Si in a content of about 1.5 to 7.0% by weight, Mn in a content of about 0.03 to 2.5% by weight, C in a content of less than about 0.003% by weight, S in a content of less than about 0.002% by weight and N in a content of less than about 0.002% by weight;

the proportion of the number of crystal grains having a grain diameter smaller than 1 mm being 25 to 98%, the proportion of the number of the crystal grains having a grain diameter of 4 to 7 mm being less than 45%, and the proportion of number of crystal grains having a grain diameter larger than 7 mm being less than 10%, each of said grains being embedded along the direction of the thickness of the steel sheet; and

a film disposed over the surface of the steel sheet, said film being composed of forsterite, said film comprising Al in an amount of about 0.5 to 15% by weight, Ti in an amount of from about 0.1 to 10% by weight and B in an amount of from about 0.01 to 0.8% by weight.

6,039,819

SOLID PROPELLANT CONTAINING FERROCENYL PHOSPHINE DERIVATIVES

Charles E. Harrod, Manassas, and William D. Stephens, Vienna, both of Va., assignors to Atlantic Research Corporation, Gainesville, Va.

Filed Mar. 4, 1982, Appl. No. 354,709

Int. Cl.[7] C06B *45/10*

U.S. Cl. 149—19.2 **10 Claims**

1. A solid propellant composition, comprising an organic polymer fuel binder, an inorganic perchlorate oxidizer salt, and a minor proportion of solid ferrocenyl phosphine or phosphine oxide burning rate accelerator of the formula.

$$R_{3-n}PR'_n \text{ or } R_{3-n}P(O)R'_n$$

where

R is alkyl, cycloalkyl, aryl or substituted aryl,

R' is ferrocenyl or substituted ferrocenyl and n is 1 to 3.

6,039,820

METAL COMPLEXES FOR USE AS GAS GENERANTS

Jerald C. Hinshaw, Pleasant View; Daniel W. Doll, North Ogden; Reed J. Blau, Richmond, all of Utah, and Gary K. Lund, Malad, Id., assignors to Cordant Technologies Inc., Salt Lake City, Utah

Filed Jul. 24, 1997, Appl. No. 899,599

Int. Cl.[7] C06B *31/00*

U.S. Cl. 149—45 **49 Claims**

1. A gas generating composition comprising:

a complex of a metal cation, at least one neutral ligand containing hydrogen and nitrogen, and sufficient oxidizing anion to balance the charge of the metal cation such that when the complex combusts, a mixture of gases containing nitrogen gas and water vapor is produced; and

at least one cool burning organic nitrogen-containing compound.

6,039,821

BONDING FIBROUS BATTS WITH THERMOSETTING FIBER-BINDERS OF CERTAIN EPOXY RESINS

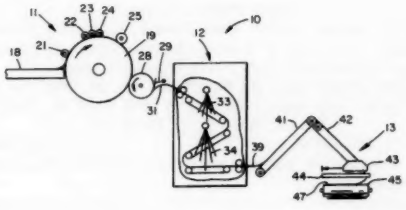
George S. Buck, 6707 Fletcher Creek Cove, Memphis, Tenn. 38133

Continuation of application No. 08/647,409, May 9, 1996, Pat. No. 5,804,005. This application Nov. 19, 1997, Appl. No. 974,100.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] D04H *5/04;* **B05D** *1/12*

U.S. Cl. 156—62.2 **35 Claims**



1. A dry process for producing a bonded, non-woven, batt of fibers comprising the steps of:

I. providing a dry, solid, particulate, B-stage, fiber-binder comprising:

A. a solid epoxy resin having:

(a) an epoxide equivalent weight of above about 500;

(b) a glass transition temperature above about 40° C.

(c) a melting point above about 70° C.; and

B. a coreactive effective amount of at least one cross-linking agent which reacts with the epoxide groups of the epoxy resin; and then

II. contacting fiber-binding amounts of the fiber-binder with the fibers to form a raw batt with the fiber-binder loosely adhering to the fibers of the batt; and then

III. heating the raw batt to a cross-linking temperature above the melting point of the fiber-binder but below the scorching or melting point of the fibers thereby melting the fiber-binder whereupon the fiber-binder flows to intersections of the fibers and subsequently the cross-linking agent reacts with the epoxide groups of the epoxy resin thereby converting the raw batt into a hot cross-linked batt; and then

IV. cooling the hot cross-linked batt.

6,039,822

DECAL APPLYING PROCESS USNG DIRECT SCREEN PRINTING

Diane S. Heyworth, and Robert C. Heyworth, both of W8324 Tower Dr., Adell, Wis. 53001

Filed Dec. 30, 1998, Appl. No. 223,573

Int. Cl.[7] B32B *31/12*

U.S. Cl. 156—82 **21 Claims**

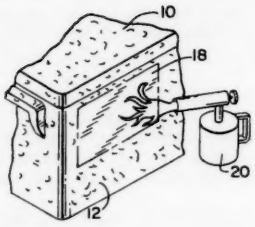
1. A method of applying a decal to a substrate comprising the steps of:

flame treating the substrate in an area where the decal is to be applied;

applying a first ink layer on the flame treated substrate;

applying a decal to the inked substrate;

heating the decaled substrate;



applying pressure to the decaled substrate; and

applying a second ink layer directly over the decaled substrate.

6,039,823

COMPOSITE ARTICLE

Albert P. Grasso, Vernon, Conn.; Ronald G. Martin, Monson, Mass., and Robert P. Roche, Cheshire, Conn., assignors to International Fuel Cells, South Windsor, Conn.

Division of application No. 08/425,282, Apr. 20, 1995, Pat. No. 5,726,105. This application Mar. 9, 1998, Appl. No. 36,950.

Int. Cl.[7] B32B *31/26;* **D04H** *1/08*

U.S. Cl. 156—89.26 **2 Claims**

1. A method for making a graphitized composite article, comprising the steps of:

forming an uncured composite article of carbon fiber felt embedded within a matrix of a carbon filler, a thermosetting resin and a solvent;

removing substantially all of the solvent from said uncured composite article;

applying pressure and heat to said uncured composite article to produce an uncured, compressed composite article;

applying pressure and heat to said uncured compressed composite article to produce a cured compressed composite article;

heating said cured compressed composite article to a first temperature thereby producing a carbonized composite article, wherein the carbon fibers, the carbon filler and the resin are substantially carbonized; and

heating the carbonized composite article to a second temperature higher than the first temperature, thereby producing said graphitized composite article; whereby said graphitized composite article is substantially impermeable to gases and liquids.

6,039,824

METHOD FOR REPAIRING A LOCALLY DAMAGED, DENTED SURFACE OF A WALL AS WELL AS A WALL COMPRISING SUCH A LOCALLY REPAIRED SURFACE

Johannes Henricus Maria Van Haandel, Boekel, Netherlands, assignor to Coöperatieve Vereniging Profile Repair, U.A.

Continuation of application No. PCT/NL96/00036, Jan. 19, 1996. This application Jul. 18, 1997, Appl. No. 896,594.

Claims priority, application Netherlands, Jan. 25, 1995, 9500133

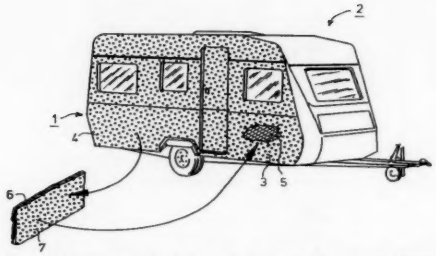
Int. Cl.[7] B32B *35/00*

U.S. Cl. 156—94 **7 Claims**

1. A method for repairing a locally damaged, dented surface of a wall, which wall is provided with a three dimensional recurring relief pattern with a portion of said recurring relief pattern being destroyed in the dented portion of said wall, comprising the steps:

(1) filling said dented portion of said wall with a single layer of filler to the initial level adequate to allow formation therein of a relief pattern which exactly matches the relief pattern which formerly existed in said dented portion;

(2) finding an undamaged part of the surface of said wall having a relief pattern which exactly matches the former relief pattern in the damaged surface of said wall;



(3) making a mould of the relief pattern in the undamaged portion of said wall located in step (2) such that said mould has therein an impression of the relief pattern that formerly existed in the damaged portion of said wall to be repaired said mould being large enough to completely cover said damaged area and having circumferential portions that contain an impression which can be matched to undamaged portions of said wall surrounding said damaged area of said wall

(4) placing said mould over said filler such that when said mould is pressed into said filler, said relief patter which originally existed in the damaged area being repaired will be formed; and

(5) forming a relief in said filler which exactly matches said original relief by pressing said mould into said filler to form an impression of the original relief pattern in said filler and removing any excess filler before the filler has completely cured.

6,039,825

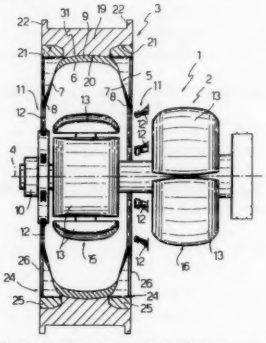
METHOD OF FORMING A COMPLETE TIRE CARCASS

Karl J. Siegenthaler, Pratteln, Switzerland, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 9, 1998, Appl. No. 94,000

Int. Cl.[7] B29D *30/08*

U.S. Cl. 156—111 **6 Claims**



1. A method of forming a complete tire carcass; the complete carcass comprising an inner carcass and an outer carcass; the inner carcass comprising an annular intermediate portion, two flexible lateral walls, and two annular beads located on either side of said intermediate portion and each connected to a respective said lateral wall; the inner carcass being formed on a forming device comprising collapsible supporting means for supporting said beads and said intermediate portion; the outer carcass being formed in a central toroidal body of a forming mold; and the method comprising the steps of inserting the inner carcass inside said toroidal body by means of said forming device; causing said intermediate portion to adhere to said outer carcass to form said complete carcass; detaching the complete carcass from the forming device by collapsing said collapsible supporting means; and extracting said forming device from said toroidal body; and being characterized by also comprising the further step of clamping said beads in a

fixed position with respect to said toroidal body prior to extracting said forming device from the toroidal body.

6,039,826

METHOD OF FORMING GREEN TIRE WITH STRIP WINDING

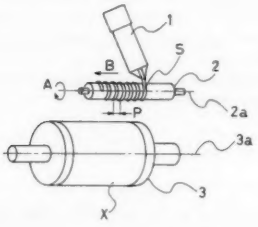
Noboru Okada, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1998, Appl. No. 61,073

Claims priority, application Japan, Apr. 22, 1997, 9-104836; Apr. 23, 1997, 9-106206

Int. Cl.[7] B29D *30/60*

U.S. Cl. 156—117 **9 Claims**



1. A method of forming a green tire comprising the steps of:

directly winding a rubber strip formed by simultaneously extruding unvulcanized rubber in a shape of the rubber strip from an extruder onto an adjusting drum in a length corresponding to the rubber quantity of a tire constituent portion, said adjusting drum comprising a straight cylinder having a same diameter in an axial direction thereof, and said rubber strip being spirally wound in a single layer at a predetermined pitch on an outer circumference of said adjusting drum in such a manner as to have adjacent portions of said rubber strip spaced apart from one another so that there is no strip overlap; and

forming said tire constituent portion by winding said rubber strip a plurality of times on an outer peripheral side of a rotary support member while unwinding said rubber strip from said adjusting drum.

6,039,827

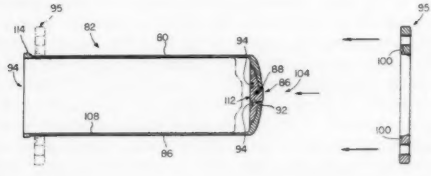
METHOD OF MAKING COMPOSITE BARRIER CAN FOR A MAGNETIC COUPLING BY FILAMENT WINDING

Margaret D. Cramer, Indian Trail, N.C., assignor to IMO Industries, Inc.

Division of application No. 08/739,803, Oct. 30, 1996, Pat. No. 5,763,973. This application Dec. 4, 1997, Appl. No. 984,942.

Int. Cl.[7] B65H *81/00*

U.S. Cl. 156—173 **26 Claims**



1. A method of making a magnetic coupling driven pump comprising the steps of:

providing a housing having an inlet and an outlet;

operatively positioning a pumping mechanism inside the housing;

operatively positioning a magnetic drive coupling proximal the pumping mechanism;

operatively connecting the pumping mechanism to a drive mechanism; and

making a magnetic barrier can having an open end and a closed end comprising the steps of:

providing at least one mandrel;

providing at least one spool piece;

operatively connecting the at least one spool piece to the at least one mandrel;

providing a winding machine having an axis;

operatively connecting the at least one spool piece to the winding machine;

providing a fiber coated with at least one resin;

winding the resin coated fiber over the at least one mandrel and about the at least one spool piece to form the closed end of the can;

operatively positioning a resistant temperature detector relative to the can such that the sensing area of the detector is located proximate the closed end of the magnetic barrier can;

heat curing the resin coated fiber on the at least one mandrel; and

removing the heat cured resin coated fiber from the at least one mandrel such that the resulting finished can has about the inner dimensions and about the outer dimensions of the at least one mandrel and is resistant to deformation; and

operatively positioning the finished can within the magnetic drive coupling.

6,039,828

METHOD OF FORMING A TAMPON HAVING A RESILIENT MEMBER

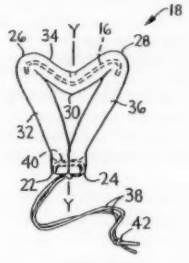
Amy Michele Achter, Neenah; Tammy Jo Balzar, Menasha, and Donald George Fox, Neenah, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of application No. 08/693,686, Aug. 12, 1996, Pat. No. 5,755,906. This application Mar. 5, 1998, Appl. No. 35,723.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B29C *53/00*

U.S. Cl. 156—217 **11 Claims**



1. A method of forming a tampon, said method comprising the steps of:

a) placing a resilient member on an absorbent to form a structure having a central longitudinal axis, said resilient member being aligned along said central longitudinal axis;

b) forming said absorbent and resilient member into an elongated softwind having a first end and a second end;

c) folding said softwind on itself such that said first and second ends are aligned adjacent to one another and said softwind contains at least two folds therebetween;

d) compressing said softwind into a pledget having an insertion end and a trailing end; and

e) securing a withdrawal string to said pledget to form a tampon, said withdrawal string facilitating removal of said tampon from a woman's vagina.

6,039,829

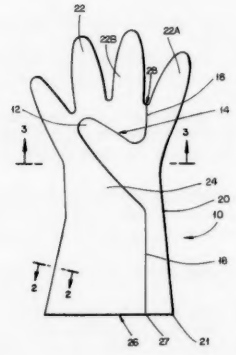
METHOD FOR MAKING THERMOBONDED GLOVES

Robert C. French, 2901 Deer Trail Pl., Solvang, Calif. 93463

Filed Jun. 6, 1997, Appl. No. 870,837

Int. Cl.[7] B32B *31/18*

U.S. Cl. 156—251 **11 Claims**



1. A method of making thermobonded gloves, comprising the steps of:

a) providing a process line having a longitudinal axis;

b) feeding a first sheet of thermoplastic material into said process line;

c) forming a loop in said first sheet of thermoplastic material, said loop being substantially perpendicular to said process line;

d) thermobonding a thumb seam between two layers of thermoplastic material forming said loop, thereby forming a thumb portion for insertion of a user's thumb therein;

e) feeding a second sheet of thermoplastic material into said process line;

f) translocating said thumb portion along said process line such that said thumb portion is in adjacent facing relation with said second sheet of thermoplastic material; and

g) thermobonding a peripheral seam between said two sheets of thermoplastic material wherein said thermobonding step comprises forming an aperture in said glove for inserting a user's hand therein, wherein the completed glove is formed with its longitudinal axis essentially perpendicular to the longitudinal axis of the process line, wherein the thumb seam has a curvilinear portion and a linear portion, the curvilinear portion defining a peripheral edge of the thumb portion and the linear portion defining a seam formed in the hand portion, wherein the linear portion is essentially parallel to the longitudinal axis of the glove.

6,039,830

METHOD OF AND APPARATUS FOR LAMINATING A SEMICONDUCTOR WAFER WITH PROTECTIVE TAPE

Bae-seung Park; Jin-heung Kim, both of Kyungki-do, and Jung-hyun Cho, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 13, 1998, Appl. No. 114,521

Claims priority, application Rep. of Korea, Jul. 25, 1997, 97-35183

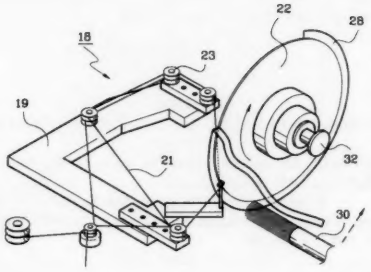
Int. Cl.[7] B32B *31/28;31/18*

U.S. Cl. 156—267 **33 Claims**

1. A semiconductor wafer tape laminating system comprising:

laminating means for attaching UV tape to the front surface of a wafer;

precutting means for cutting the UV tape around the wafer as spaced therefrom to leave an edge of the tape protruding beyond the peripheral edge of the wafer;



wire cutting means for cutting the edge of the UV tape left around the wafer by the precutting device to sever it from a portion of the tape attached to the front surface of the wafer; and

ultra-violet illuminator means for irradiating the edge of the UV tape with ultra-violet rays.

6,039,831

ELECTRICALLY CONDUCTIVE SILICONE ELASTOMER COMPOSITIONS, METHODS FOR MANUFACTURING SEMICONDUCTOR DEVICES, AND SEMICONDUCTOR DEVICES

Katsutoshi Mine; Osamu Mitani; Kazumi Nakayoshi, and Rikako Tazawa, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Division of application No. 08/840,475, Apr. 21, 1997, Pat. No. 5,872,170. This application Jan. 15, 1999, Appl. No. 231,949.

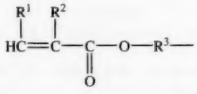
Claims priority, application Japan, Apr. 26, 1996, 8-131435

Int. Cl.[7] B32B *31/28*

U.S. Cl. 156—272.6 **8 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:

mounting a semiconductor chip on a substrate using an electrically conductive silicone elastomer composition comprising (A) 100 parts by weight of an organopolysiloxane consisting essentially of (a) 5–95% by weight of an acrylic functional group-containing organopolysiloxane having an average of at least two silicon-bonded acrylic groups per molecule having the formula:



wherein R^1 is a hydrogen atom or a monovalent hydrocarbon group. R^2 is a hydrogen atom or a monovalent hydrocarbon group, and R^3 is a divalent hydrocarbon group having 1–10 carbon atoms; and (b) 95–5% by weight of an alkenyl group-containing organopolysiloxane having an average of at least two silicon-bonded alkenyl groups per molecule: (B) a silicon-bonded hydrogen atom-containing organopolysiloxane having an average of at least two silicon-bonded hydrogen atoms per molecule, in a quantity sufficient to provide 0.5 to 20 moles of silicon-bonded hydrogen atoms in component (B) per mole of silicon-bonded alkenyl group in component (b); (C) 50–2,000 parts by weight of an electrically conductive filler: (D) 0.1–20 parts by weight of a photosensitizer: and (E) a platinum catalyst, in a sufficient quantity to cure the electrically conductive silicone elastomer composition;

irradiating said composition with a high-energy beam to induce an acrylic functional group free radical reaction; and then

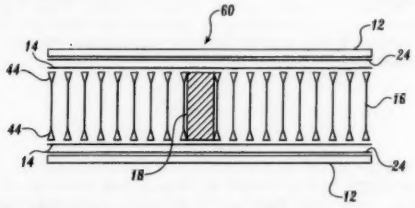
allowing the composition to cure via a hydrosilylation reaction.

6,039,832

THERMOPLASTIC TITANIUM HONEYCOMB PANEL

Douglas A. McCarville, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1998, Appl. No. 32,227
Int. Cl.[7] B32B *31/04;31/12*
U.S. Cl. 156—292 **29 Claims**



1. A structural panel sequentially comprising:

(a) a first face sheet having an outward facing surface and an inward facing bonding surface, wherein the outward facing surface comprises a first resinous material and the inward facing bonding surface comprises a second resinous material, wherein the melt temperature of the first resinous material is greater than the melt temperature of the second resinous material;

(b) a first bonding layer, comprising a third resinous material having a melt temperature comparable to the melt temperature of the second resinous material;

(c) a titanium honeycomb core, comprising resin fillets;

(d) a second bonding layers comprising a third resinous material having a melt temperature comparable to the melt temperature of the second resinous material; and

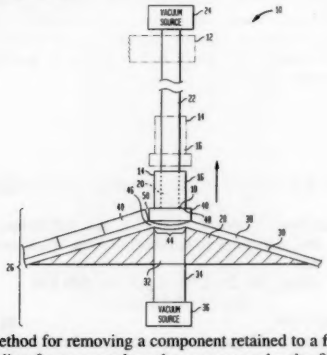
(e) a second face sheet having an outward facing surface and an inward facing bonding surface, wherein the outward facing surface comprises a first resinous material and the inward facing bonding surface comprises a second resinous material, wherein the melt temperature of the first resinous material is greater than the melt temperature of the second resinous material.

6,039,833

METHOD AND APPARATUS FOR COMPONENT PICKUP

Joseph Michael Freund, Fogelsville; George John Przybylek, Douglasville, and Dennis Mark Romero, Allentown, all of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 4, 1998, Appl. No. 34,844
Int. Cl.[7] B32B *35/00*
U.S. Cl. 156—344 **10 Claims**



1. A method for removing a component retained to a film carrier by a bonding force exerted on the component by the film carrier, the method comprising the steps of:

supporting a section of the film carrier lying beneath the component on a base member having a convex-shaped surface and a vacuum slot adjacent the apex of the convex-shape; whereby the component is aligned over the vacuum slot and the slot is sized smaller than the length of the component so that the component is supported over the slot by the base member;

pulling a portion of the supported film carrier section into the slot with a force consisting essentially of vacuum force so that the film is pulled away from the component to substantially reduce the bonding force exerted on the component by the film carrier; and

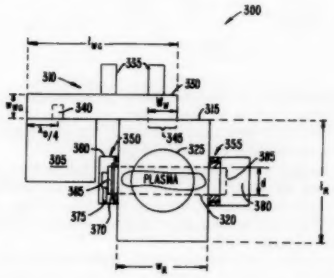
vacuum lifting the component off the film carrier.

6,039,834

APPARATUS AND METHODS FOR UPGRADED SUBSTRATE PROCESSING SYSTEM WITH MICROWAVE PLASMA SOURCE

Tsutomu Tanaka, Santa Clara; Mukul Kelkar, San Jose; Kevin Fairbairn, Saratoga; Hari Ponnekanti, Santa Clara, and David Cheung, Foster City, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Mar. 5, 1997, Appl. No. 811,627
Int. Cl.[7] H05H *1/00*
U.S. Cl. 156—345 **25 Claims**



1. A remote microwave plasma source module for use with a substrate processing apparatus, said remote microwave plasma source module comprising:

a magnetron system, said magnetron system including a first magnetron operating on a first pulsed, low wattage power source, said magnetron system providing microwaves at low microwave power;

a resonator cavity, said resonator cavity having a first surface having a first window, said resonator cavity resonating said microwaves;

a waveguide system, said waveguide system including a first waveguide coupled to said first magnetron, said waveguide system coupled to said resonator cavity through said first window, said first waveguide directing microwaves from said first magnetron into said resonator cavity via said first window;

a first plasma discharge tube having a tube length and a tube diameter, said first plasma discharge tube disposed within said resonator cavity wherein a field maximum of said microwaves overlaps with said tube diameter along said tube length which is substantially parallel to said first surface, said first plasma discharge tube receiving a reactive gas and discharging radicals from said reactive gas energized by said microwaves in said resonator cavity; and

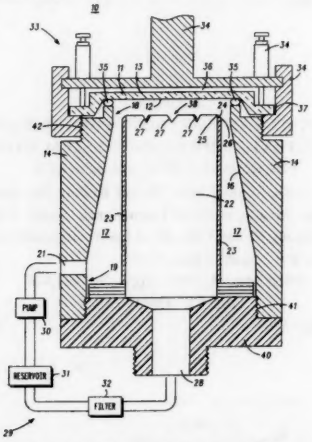
wherein said remote microwave plasma source module is configured as a modular unit that may be easily attachable to said substrate processing apparatus, said modular unit having a footprint comparable to a top dimension of said substrate processing apparatus.

6,039,835

ETCHING APPARATUS AND METHOD OF ETCHING A SUBSTRATE

Pawitter Jit Singh Mangat, Chandler; Philip Armin Seese, Phoenix, and William Joseph Dauksher, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 15, 1997, Appl. No. 929,686
Int. Cl.[7] C23F *1/08*
U.S. Cl. 156—345 **24 Claims**



1. An apparatus for etching a substrate comprising:

a first chamber having an output port;

a second chamber contained within the first chamber, wherein the second chamber has an input port;

a cover having a first portion and a second portion, the first portion of the cover being suspended over the first chamber and the second chamber, wherein the cover isolates the first chamber and the second chamber from an ambient surrounding the apparatus; and

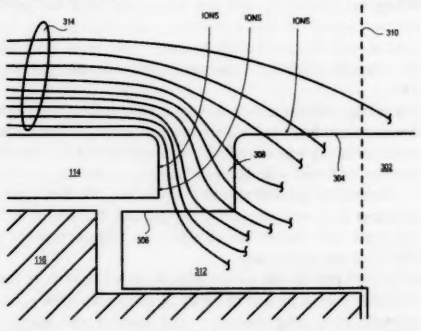
a recirculating system coupled to the input port and the output port so that an etchant can flow into the second chamber from the input port and out the first chamber through the output port.

6,039,836

FOCUS RINGS

Rajinder Dhindsa, Milpitas; Vikram Singh, Santa Clara, and Ken Tokunaga, Fremont, all of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed Dec. 19, 1997, Appl. No. 993,791
Int. Cl.[7] C23C *16/50*; H05H *1/00*
U.S. Cl. 156—345 **9 Claims**



1. A focus ring configured for use in a plasma processing chamber, said focus ring also being configured to overlap at least a portion of a substrate-holding chuck that is powered by radio frequency (RF) power during plasma operation to act as an electrode, comprising:

an upper surface, said upper surface being exposed to a plasma region within said plasma processing chamber during said plasma operation; and

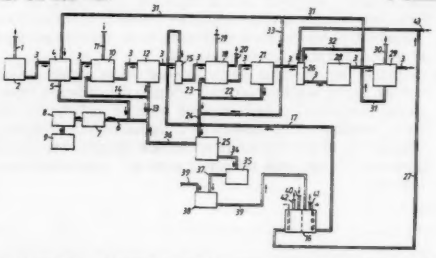
a chuck overlapping portion, said chuck overlapping portion overlaps said portion of said substrate-holding chuck, a portion of said chuck-overlapping portion being formed of a first material having a lower dielectric constant than the rest of said chuck-overlapping portion.

6,039,837

METHOD OF BLEACHING PULP WITH OZONE WHEREIN THE ACIDITY IS MAINTAINED WITH AN ACID SOLUTION PREPARED BY ELECTROLYSIS OR ELECTRODIALYSIS

Rolf C. A. Brännland, Bromma, and Sture E. O. Noréus, Husum, both of Sweden, assignors to Mo Och Domsjö Aktiebolag, Örnsköldsvik, Sweden

Continuation of application No. 08/774,674, Dec. 26, 1996, abandoned, which is a continuation of application No. 08/204,368, Sep. 2, 1994, abandoned. This application Jul. 9, 1998, Appl. No. 112,325.
Claims priority, application Sweden, Sep. 17, 1991, 9102693
Int. Cl.[7] D21C *9/153*; *11/00*
U.S. Cl. 162—29 **5 Claims**



1. A method of bleaching with ozone lignocellulosic pulp which has been at least partially manufactured chemically, in the presence of water at a degree of acidity, expressed as pH, of 2–5,

wherein the acidity is maintained during the ozone bleaching process by adding a sulfuric acid solution or an acid sulphate solution, wherein the solution is prepared by electrolysis or electrodialysis of a neutral sodium sulfate solution obtained by mixing waste liquor from the ozone bleaching process with waste liquor from an alkaline treatment stage so as to obtain a neutral solution, and cooling the resultant solution so as to precipitate sodium sulphate therefrom; and removing the sodium sulphate precipitate and dissolving it in essentially clean water.

6,039,838

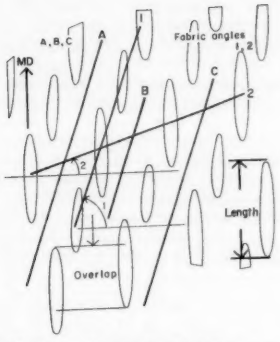
SYSTEM FOR MAKING ABSORBENT PAPER PRODUCTS

Kenneth Kaufman, Mount Laurel, N.J., and Jeff Herman, Bala Cynwyd, Pa., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Dec. 29, 1995, Appl. No. 580,830
Int. Cl.[7] D21F *11/00*
U.S. Cl. 162—109 **28 Claims**

1. An improved method of making an absorbent paper product such as toilet tissue, comprising steps of:

(a) transferring a fibrous web onto a drying fabric that is characterized by a plurality of shute threads extending substantially parallel to each other in a cross-direction of the drying fabric and a plurality of warp threads extending substantially parallel to each other in a machine direction of the drying



fabric, said shute and warp threads being woven together so as to define a top surface plane on the web side of the fabric having only a number of relatively long warp knuckles having a length longer than 0.060 inch at locations where one of said warp threads crosses over at least four of said shute threads, said long warp knuckles being positioned in a shed pattern so as to form (a) a first axis of bulky ridges that are defined by long warp knuckles which are positioned next to each other on adjacent warp threads, said first axis being disposed at a first angle with respect to the cross-direction of the drying fabric, said first angle being substantially within the range of greater than 68 degrees but less than 90 degrees; and (b) a second axis formed by each of said long warp knuckles with other, overlapping long warp knuckles on nearby, but not immediately adjacent, warp threads, said second axis forming a second angle with respect to the cross-direction of the drying fabric, said second angle being less than about 28 degrees;

(b) drying the fibrous web while it is on the drying fabric; and

(c) removing the web from the drying fabric.

6,039,839

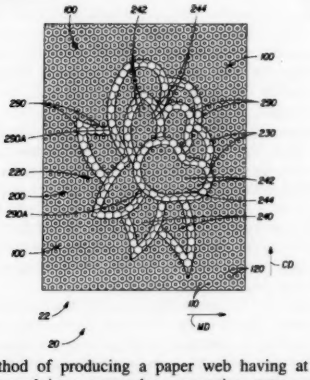
METHOD FOR MAKING PAPER STRUCTURES HAVING A DECORATIVE PATTERN

Paul Dennis Trokhan, Hamilton; Dean Van Phan, West Chester; Howard Thomas Deason, Hamilton, and Jörg Kleinwächter, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 3, 1998, Appl. No. 17,831

Int. Cl.[7] D21F *11/00*

U.S. Cl. 162—116 **21 Claims**



1. A method of producing a paper web having at least two regions disposed in a nonrandom, repeating pattern and being distinguishable from each other by at least one property selected from the group consisting of basis weight, density, thickness, and fiber composition; the method comprising the steps of:

providing a plurality of fibers suspended in a liquid carrier;

providing a fiber retentive forming element having liquid pervious zones;

depositing the fibers and the liquid carrier onto the forming element;

draining the liquid carrier through the forming element in simultaneous stages to form a web having a background portion and a decorative pattern, wherein the decorative pattern comprises at least one high basis weight region having a basis weight which is greater than the basis weight of the surrounding background portion; said high basis weight region forming at least a portion of a border defining the shape of decorative indicia.

6,039,840

ROLL FOR A SUPERCALENDER AND METHOD FOR CALENDERING A WEB

Pauli Kytönen, Tuusula; Juha Koriseva, and Erkki Leinonen, both of Järvenpää , all of Finland, assignors to Valmet Corporation, Helsinki, Finland

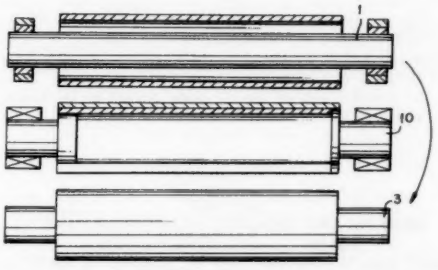
Continuation of application No. 08/828,274, Mar. 21, 1997. This application Dec. 16, 1998, Appl. No. 213,030.

Claims priority, application Finland, Apr. 11, 1996, 961585

This patent is subject to a terminal disclaimer.

Int. Cl.[7] D21G *1/02*

U.S. Cl. 162—205 **18 Claims**



1. In a multi-nip calender including at least first, second and third calender rolls stacked in a substantially vertical column, said first calender roll being arranged between said second calender roll and said third calender roll such that said first calender roll defines a first calendering nip with said second calender roll and a second calendering nip with said third calender roll and is operatively loaded by said second and third calender rolls, the improvement comprising:

said first calender roll comprising an elongate, tubular frame having a hollow interior and extending in an axial direction of said first calender roll, said frame having a middle area and lateral areas having an axial length extending between an end of said middle area and a respective end of said frame, said frame having a non-uniform rigidity such that said frame deforms in a radial direction less in said lateral areas than in said middle area during loading of said first calender roll,

a polymer coating arranged on said frame of said first calender roll for compensating for the lesser deformation of said lateral areas of said frame during loading of said first calender roll, said polymer coating having a first portion arranged on said middle area of said frame and a second portion arranged on each of said lateral areas of said frame,

said polymer coating including a layer of polymer material, said layer of polymer material and said frame being arranged such that the thickness of said layer of polymer material increases in said lateral areas over the axial length from the end of said middle area to the respective end of said frame and such that an outer diameter of the roll is substantially constant over the entire length of the roll in the axial direction.

6,039,841

SCREEN HAVING INCLINED SLOTS FOR USE IN A CONTINUOUS DIGESTER

Lasse Hernesniemi, Pietarsaari, Finland, assignor to Ahlstrom Machinery Inc., Glen Falls, N.Y.

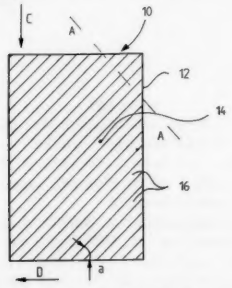
PCT No. PCT/FI96/00104, § 371 Date Dec. 2, 1997, § 102(e) Date Dec. 2, 1997, PCT Pub. No. WO96/26315, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 22, 1996, Appl. No. 894,528

Claims priority, application Finland, Feb. 23, 1995, 950826

Int. Cl.[7] **D21C** *7/00;* **B07B** *1/49;* **B01D** *29/07*

U.S. Cl. 162—251 **20 Claims**



1. A screen used in the production of cellulose pulp mounted in a digester:

said digester having an internal surface,

said screen comprising a screen plate secured to said digester internal surface, said screen plate having a plurality of slots formed therein with an inclination angle; and

said screen plate positioned in and secured to said digester so that said inclination angle α of said slots relative to the horizontal x axis of the x-y plane defined by the internal surface of the digester is between 30–60 degrees.

6,039,842

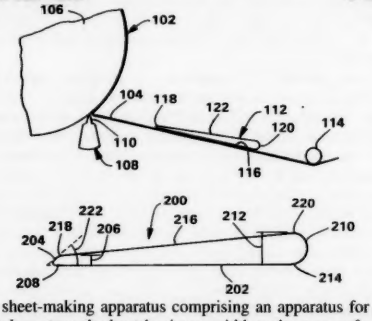
METHOD AND APPARATUS FOR STABILIZING A MOVING LOW-STRENGTH SHEET

Jark C. Lau, 2525 Powder Ridge Dr., Roswell, Ga. 30076, and Philip Sim Lin, 2543 Village La., Oshkosh, Wis. 54904

Continuation of application No. 08/655,332, May 24, 1996, Pat. No. 5,759,352. This application Mar. 23, 1998, Appl. No. 46,803.

Int. Cl.[7] **D21G** *9/00;1/02*

U.S. Cl. 162—272 **3 Claims**



1. A sheet-making apparatus comprising an apparatus for stabilizing a low-strength sheet having a width and a top surface and moving in a first direction at a rate sufficient to induce a layer of entrained air adjacent to a surface of the sheet, which stabilizing apparatus comprises:

an airfoil extending along the top surface of the sheet, the airfoil comprising:

a bottom surface extending along a portion of the top surface of the sheet;

a first surface extending a first distance from the bottom surface at a first juncture;

a second surface extending a second distance from the bottom surface at a second juncture; and

a top surface extending from the first surface at a third juncture to the second surface at a fourth juncture;

in which:

the first distance is less than the second distance;

the apparatus is oriented in a manner such that the portion of the apparatus which first encounters the entrained air is the first surface of the airfoil; and

the first and bottom surfaces of the airfoil form an acute angle such that the first surface directs a substantial portion of the entrained air away from the sheet.

6,039,843

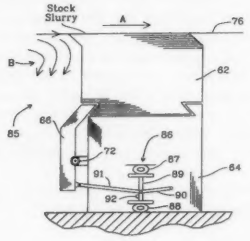
LOADED CLAMPED FOIL BLADE FOR USE IN A WEB-FORMING SECTION OF A PAPERMAKING MACHINE

E. William Wight, Roscoe, Ill., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed May 19, 1998, Appl. No. 81,622

Int. Cl.[7] **D21F** *1/54*

U.S. Cl. 162—352 **13 Claims**



9. An apparatus for dewatering stock on a forming fabric to form a paper web, comprising:

a dewatering device;

a foil blade mounting pad, having portions defining one dove-tail protrusion, the mounting pad being mounted to the dewatering device;

a foil blade having a first dove-tail slot and a second opposed dove-tail slot, the foil blade being mounted to the mounting pad, the first dove-tail slot cooperating with the dove-tail protrusion on the foil blade mounting pad to position and hold the foil blade in position with respect to the mounting pad;

a clamping piece pivotally mounted at a pivot to the foil blade mounting pad, the clamping piece having an upper end having a top surface shaped to cooperate with the second dove-tail slot to position and hold the foil blade in position with respect to the mounting pad, and the clamping piece having a lower end, opposite the upper end, the pivot being between the upper end and the lower end;

a first means for clamping the foil blade to the dewatering device such that the foil blade is rigidly mounted to the dewatering device so that the foil blade is substantially immovable during a papermaking process as a wire or fabric having a stock mixture thereon travels over the foil blade, the means being mounted between the pivot and the lower end, and between the clamping piece and the mounting pad, the first means biasing the top surface into locking engagement with the second dove-tail slot; and

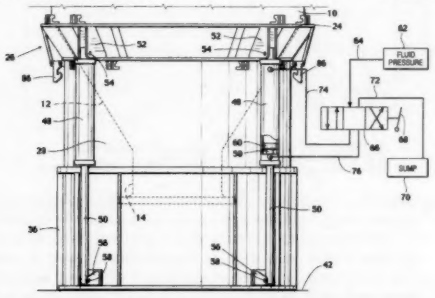
an inflatable tube for unclamping the foil blade from the dewatering device allowing the foil blade to be easily installed or removed from the dewatering device during a blade changing operation, the inflatable tube being positioned between the clamping piece and the mounting pad and between the pivot and the upper end of the clamping piece, the tube when inflated biasing the top surface out of locking engagement with the second dove-tail slot.

6,039,844

CONTAINMENT SYSTEM FOR COKE DRUMS

Tariq Malik, Corpus Christi, Tex., assignor to Citgo Petroleum Corporation, Tulsa, Okla.

Filed Oct. 9, 1998, Appl. No. 169,127
Int. Cl.[7] C10B *39/04;41/00;25/10*
U.S. Cl. 202—227 **17 Claims**



1. An apparatus for confining the discharge of coke, liquids and/or gases from a bottom outlet of a coke drum, the coke drum being supported above a switch deck floor, comprising:

a shield of dimensions in a horizontal plane greater than that of a horizontal plane of the coke drum bottom outlet and of vertical height at least about as great as the height of the bottom outlet above the switch deck floor;

a system to move said shield into position to cover an area from the drum bottom outlet to the switch deck floor.

6,039,845

PROCESS FOR THE PURIFICATION OF PENTAFLUOROETHANE BY EXTRACTIVE DISTILLATION

Rene Bertocchio; Eric Lacroix, and Sylvain Perdrieux, all of Puteaux, France, assignors to Elf Atochem S.A., France

Filed Jan. 2, 1998, Appl. No. 2,344
Claims priority, application France, Jan. 6, 1997, 97 00053
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B01D *3/34*
U.S. Cl. 203—57 **3 Claims**

1. Process for the purification of a pentafluoroethane (F125) containing chloropentafluoroethane (F115) by extractive distillation, comprising purifying said pentafluoroethane where the extractant employed is a perfluoroalkyl halide RfX in which Rf denotes a linear or branched radical C_nF_{2n+1} containing 5 to 8 carbon atoms and X is chloride, bromide, or iodide.

6,039,846

SEPARATION OF 3-METHYL-2-PENTENAL FROM N-BUTANOL BY AZEOTROPIC DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715

Filed Jul. 22, 1999, Appl. No. 359,614
Int. Cl.[7] B01D *3/36;* **C07C** *29/82;45/84*
U.S. Cl. 203—57 **1 Claim**

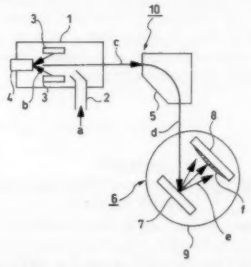
1. A method for recovering 3-methyl-2-pentenal from a mixture of 3-methyl-2-pentenal and n-butanol which consists essentially of distilling a mixture of 3-methyl-2-pentenal and n-butanol in the ptesence of an azeotrope forming agent, recovering the 3-methyl-2-pentenal and the azeotrope forming agent as overhead product and obtaining the n-butanol as bottoms product, wherein said azeotrope forming agent consists essentially of one material selected from the group consisting of 2,3-dimethylbutane, decahydronapthalene, t-butyl methyl-ether, triethanol amine, trimethylene sulfone, sulfolane, 2-nitrotoluene, dimethoxymethane, petroleum ether, tetramethylortho-silicate, 2,5-diethyl aniline and cyclopentane.

6,039,847

METHOD OF FORMING A HIGHLY PURE THIN FILM AND APPARATUS THEREFOR

Akiyoshi Chayahara; Yuji Horino; Atsushi Kinomura; Nobuteru Tsubouchi, and Kanenaga Fujii, all of Ikeda, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 12, 1998, Appl. No. 41,099
Claims priority, application Japan, Jun. 23, 1997, 9-183109
Int. Cl.[7] C23C *14/34*
U.S. Cl. 204—192.11 **8 Claims**



1. A method of forming a thin film by ion beam sputtering, comprising the following steps:

(a) sputtering a material of ions with cesium ions to generate negative ions, wherein the cesium ions are generated by thermally ionizing a cesium vapor at a temperature of from 1000° C. to 1100° C.,

(b) accelerating and mass-separating the negative ions to obtain a negative ion beam, and

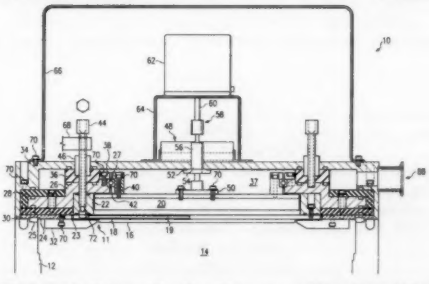
(c) sputtering a starting material of thin film with said negative ion beam thereby to form a thin film on a base material.

6,039,848

ULTRA-HIGH VACUUM APPARATUS AND METHOD FOR HIGH PRODUCTIVITY PHYSICAL VAPOR DEPOSITION.

Mehrdad M. Moslehi, Los Altos, Calif.; Cecil J. Davis, Greenville, Tex., and Dorian Heimanson, Rochester, N.Y., assignors to CVC Products, Inc., Rochester, N.Y.

Continuation of application No. 08/677,893, Jul. 10, 1996, abandoned, Provisional application No. 60/000,980, Jul. 10, 1995. This application Oct. 27, 1997, Appl. No. 958,877.
Int. Cl.[7] C23C *14/34;14/35*
U.S. Cl. 204—192.12 **33 Claims**



22. A method for enhancing the vacuum integrity within a vacuum chamber in a magnetron sputtering system for sputtering a material from a target onto a substrate contained within the vacuum chamber, comprising;

forming a portion of the vacuum chamber with a backing plate assembly comprising a backing plate, an extender ring, and an insulated spacer ring;

coupling the extender ring to the vacuum chamber walls at the periphery of the extender ring;

positioning the insulated spacer ring between the backing plate and the extender ring to electrically isolate the backing plate from walls of the vacuum chamber;

forming a first hermetically sealed junction between said insulated spacer ring and said backing plate, wherein said first sealed junction is operable to maintain a vacuum in the vacuum chamber;

forming a second hermetically sealed junction between said insulated spacer ring and said extender ring, wherein said second sealed junction is operable to maintain a vacuum in the vacuum chamber; and

coupling the backing plate assembly to the walls of the vacuum chamber at the junction between the extender ring and the walls of the vacuum chamber with a vacuum seal capable of sealing the vacuum chamber to maintain a low-base-pressure vacuum state in the vacuum chamber.

6,039,849

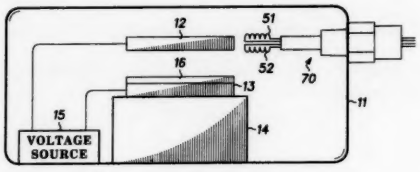
METHOD FOR THE MANUFACTURE OF ELECTRONIC COMPONENTS

Jeffrey R. Paulson, Mesa, and Arturo Fonda, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 28, 1997, Appl. No. 959,310

Int. Cl.[7] **C23C** *14/34*

U.S. Cl. 204—192.12 **6 Claims**



1. A method of manufacturing an electronic component comprising the steps of:

providing an apparatus having a target and also having a plasma ignitor, wherein the plasma ignitor includes at least a first filament and a second filament; placing a semiconductor substrate in a reaction chamber of the apparatus;

activating the first filament while the second filament is inactive wherein the activating results in formation of a plasma in the reaction chamber and depositing a portion of the target onto at least a portion of the semiconductor substrate in the reaction chamber; and

activating the second filament while the first filament is inactive.

6,039,850

SPUTTERING OF LITHIUM

Stephen C. Schulz, Princeton, N.J., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application No. 08/567,781, Dec. 5, 1995, Pat. No. 5,830,336. This application May 29, 1997, Appl. No. 865,544.

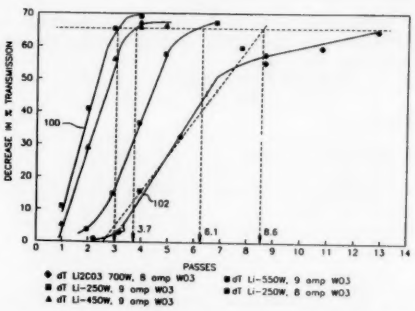
Int. Cl.[7] **C23C** *14/34*

U.S. Cl. 204—192.15 **38 Claims**

30. A method of sputtering lithium comprising the steps of:

(a) providing a target including a top layer of metallic lithium defining an exposed surface and a metallic supporting layer, a counterelectrode and a substrate;

(b) maintaining the target, counterelectrode and substrate in a substantially inert atmosphere at subatmospheric pressure; and, while maintaining the target in said substantially inert atmosphere:



(c) applying a sputtering potential between said counterelectrode and said target, said sputtering potential including being either an alternating potential or a direct potential in a forward direction so that said target is negative with respect to said counterelectrode, said step of applying a sputtering potential being performed so as to maintain a plasma adjacent to said target and sputter metallic lithium from said target under the influence of said sputtering potential; and

(d) during one or more intervals prior to termination of said first potential, applying a clearing potential between said counterelectrode and said target, said clearing potential being different from said sputtering potential and including a reverse potential in a reverse direction opposite to said forward direction,

the method further comprising the step of continuously moving said substrate in a direction of motion during said step of imposing a potential to thereby expose new regions of the substrate to said expelled lithium.

6,039,851

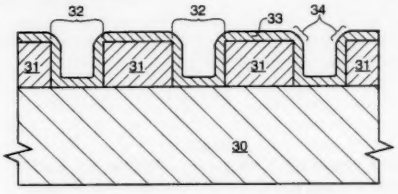
REACTIVE SPUTTER FACETING OF SILICON DIOXIDE TO ENHANCE GAP FILL OF SPACES BETWEEN METAL LINES

Ravi Iyer, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/409,372, Mar. 22, 1995. This application Jan. 14, 1998, Appl. No. 6,729.

Int. Cl.[7] **C23C** *14/34*; **H01L** *21/465*

U.S. Cl. 204—192.32 **12 Claims**



1. A process for fabrication of a semiconductor device, comprising the steps of:

providing a semiconductor wafer having a topology formed thereon, said topology having a plurality of recesses;

forming an insulating layer over said topology, said insulting layer extending into said recesses and forming bread-loafed openings in said insulating layer formed by converging surfaces of said insulting layer;

removing a portion of said converging surfaces to remove at least a portion of a bread-loaf buildup of insulating material about said bread-loafed openings, said step of removing comprises an etch step using a gas combination of an inert gas and a chemically reactive gas that prevents dislodged insulating layer particles from re-sputtering into said gaps; and

after said step of removing, forming a fill layer over said insulating layer to at least partially planarize said semiconductor wafer.

6,039,852

BIPOLAR PLATE FOR FILTER PRESS ELECTROLYZERS

Fulvio Federico, Piacenza, Italy, assignor to DE NORA S.p.A., Italy

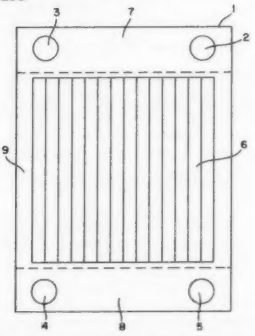
PCT No. PCT/EP97/02288, § 371 Date Oct. 27, 1998, § 102(e) Date Oct. 27, 1998, PCT Pub. No. WO97/42359, PCT Pub. Date Nov. 13, 1997

PCT Filed May 6, 1997, Appl. No. 180,056

Claims priority, application Italy, May 6, 1996, MI96A0911

Int. Cl.[7] **C25B** *9/00*

U.S. Cl. 204—255 **5 Claims**



1. Bipolar plate for use in bipolar electrolyzer of the filter-press type, said plate (**1**) comprising a central portion (**9**) made of a conductive composite obtained from a mixture of graphite or conductive carbon powder or fibers and powder of a corrosion resistant thermoplastic polymer, and two terminal portions (**7**,**8**) made of a composite obtained from a mixture of said graphite or conductive carbon powder or fibers and said powder of the corrosion resistant thermoplastic polymer, said terminal portions having a higher electrical resistively than the central portion and containing holes (**2**,**3**,**4**,**5**) for distribution of fresh electrolytes and the withdrawal of exhausted electrolytes and electrolysis products, said central portion (**9**) and terminal portions (**7**,**8**) forming an integral element, characterized in that

said central portion (**9**) contains more than 60% by weight of said graphite or conductive carbon powder or fibers,

said terminal portions (**7**,**8**) have a low content of said graphite or conductive carbon powder or fibers such that the electrical resistively of said terminal portions (**7**,**8**) is at least ten times higher than that of the central portion (**9**), and

said terminal portions (**7**,**8**) further comprise an additional non-conductive corrosion resistant material to reduce the difference in the thermal expansion coefficient between said central portion (**9**) and said terminal portions (**7**,**8**).

6,039,853

ELECTROCHEMICAL HALF-CELL

Fritz Gestermann, Leverkusen; Hans-Dieter Pinter, Wermelskirchen; Karl-Ludwig Metzger, Bergisch Gladbach, and Heiko Herold, Neuss, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

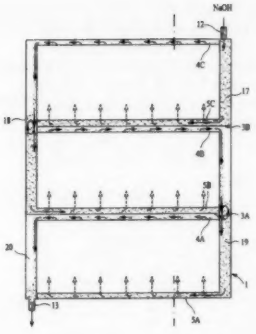
Filed Apr. 8, 1998, Appl. No. 57,227

Claims priority, application Germany, Apr. 14, 1997, 197 15 429

Int. Cl.[7] **C25B** *9/00*

U.S. Cl. 204—258 **8 Claims**

1. An electrochemical half-cell (**1**) comprising an electrode chamber (**2**) for the accommodation of an electrolyte (**23**), a gas



chamber (**6**), and at least one gas diffusion electrode (**7**) which separates the gas chamber (**6**) and the electrode chamber (**2**) and serves as cathode or anode, characterized in that the electrode chamber (**2**) is divided into compartments (**2***a*, **2***b*, **2***c*) which, for the passage of the electrolyte (**23**), are connected to one another in cascade fashion via chutes (**17**), (**18**), (**19**).

6,039,854

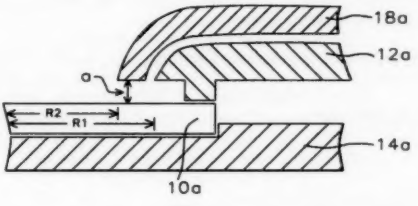
SUBSTRATE CLAMP DESIGN FOR MINIMIZING SUBSTRATE TO CLAMP STICKING DURING THERMAL PROCESSING OF THERMALLY FLOWABLE LAYERS

David Liu, Taipei, Taiwan, assignor to Vanguad International Semiconductor Corporation, Hsin-Chu, Taiwan

Division of application No. 08/782,707, Jan. 13, 1997, Pat. No. 5,843,520. This application Sep. 21, 1998, Appl. No. 157,514.

Int. Cl.[7] **C23C** *14/50*

U.S. Cl. 204—298.11 **10 Claims**



1. A clamp for fixturing a substrate when forming and thermally processing upon the substrate a thermally flowable layer comprising:

a backing member;

a top member connected through a first mechanical means to the backing member, the backing member and the top member being sized such that a substrate may be clamped between the backing member and the top member, a portion of the top member overlapping the substrate and leaving exposed a first portion of the substrate when the substrate is clamped between the backing member and the top member; and

a shroud connected through a second mechanical means to the backing member, a portion of the shroud overlapping the top member, the shroud leaving exposed a second portion of the substrate which is smaller than and contained within the first portion of the substrate, the shroud being removable from the backing member while the substrate remains clamped between the backing member and the top member.

6,039,855

TARGET FOR THE SPUTTERING CATHODE OF A VACUUM COATING APPARATUS AND METHOD FOR ITS MANUFACTURE

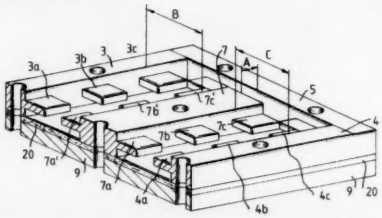
Norbert Wollenberg, Grosskrotzenburg, Germany, assignor to Leybold Materials GmbH, Hanau, Germany

Filed Sep. 25, 1996, Appl. No. 719,614

Claims priority, application Germany, Sep. 27, 1995, 195 35 894

Int. Cl.[7] **C23C** *14/34*

U.S. Cl. 204—298.12 **5 Claims**



1. Sputter cathode arrangement with a back plate and a frame surrounding a target material to be sputtered having a target plane and a separating layer laid between the frame and the back plate, characterized by a plurality of tongues extending from the frame in a plane parallel to the target plane, extending a distance into the target material and affixed to the frame for mounting the target material cast into an interstitial space surrounded by the frame, the frame having an elongated, approximately rectangular configuration having two long frame side parts parallel to one another, with each having aq length and between the two long frame side parts parallel to one another there is provided a central bridge having a length extending alongside the two long frame side parts parallel to one another, the length of the bridge being shorter than the length of the two long frame side parts parallel to one another.

6,039,856

MEASURING DEVICE

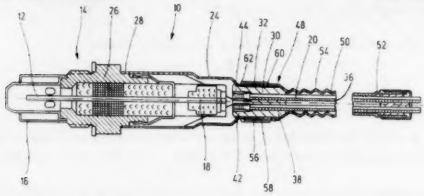
Helmut Weyl, Schwieberdingen, and Bernhard Wild, Markgroeningen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 22, 1998, Appl. No. 64,437

Claims priority, application Germany, Apr. 23, 1997, 197 17 036

Int. Cl.[7] **G01N** *27/28*

U.S. Cl. 204—400 **14 Claims**



1. A measuring device comprising:

a housing, the housing being a protective sleeve;

a sensor element arranged in the housing at a measuring point, the sensor element being connected via electrical connecting lines to an evaluation circuit spaced from the measuring points;

a second sleeve arranged within a section of the protective sleeve, the second sleeve having feed-through openings which receive the electrical connecting lines; and

a protective device through which the electrical connecting lines extend to the protective sleeve, the protective device protecting the electrical connecting lines, the protective device including a connecting section which extends over the section of the protective sleeve, the protective sleeve having a coating formed thereon at least in an area of the connecting section, the coating not contacting the second sleeve, the coating forming a sealing seat between the protective sleeve and the protective device.

6,039,857

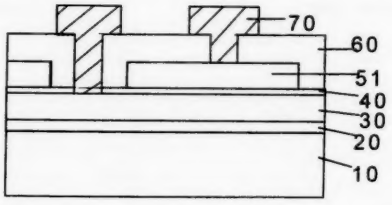
METHOD FOR FORMING A POLYOXIDE FILM ON DOPED POLYSILICON BY ANODIZATION

Ching-Fa Yeh, and Jeng-Shu Liu, both of Department of Electronics Engineering, National Chiao-Tung University, Hsinchu, Taiwan

Filed Nov. 9, 1998, Appl. No. 188,062

Int. Cl.[7] **C25D** *5/18*

U.S. Cl. 205—106 **14 Claims**



8. A method to improve the data retention characteristics for a nonvolatile memory device, which comprises forming an anodic polyoxide film between a doped polysilicon floating gate and a doped polysilicon control gate of said nonvolatile memory device, wherein said anodic polyoxide film is formed by conducting an electrolytic reaction such that said inter-polysilicon polyoxide film is formed on the doped polysilicon floating gate acting as an anode, and subjecting said anodic polyoxide film to an annealing treatment or a plasma passivation treatment.

13. The method according to claim **8**, wherein said electrolytic reaction is carried out with a constant or variable current ranging from 9 0.001–2 A, or with a constant or variable electrolyzing voltage ranging from 1–150 V.

6,039,858

PLATING PROCESS FOR X-RAY MASK FABRICATION

Robin J. Ackel, Swanton; Douglas E. Benoit; Michael H. Charland, both of Essex Junction, and Thomas B. Faure, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1998, Appl. No. 120,774

Int. Cl.[7] **C25D** *5/02*

U.S. Cl. 205—136 **4 Claims**

1. A method for the electroplating on one side of a substrate which is immersed in an electroplating bath, the method comprising the steps of:

providing a plating system comprising:

a tank containing an electrolyte;

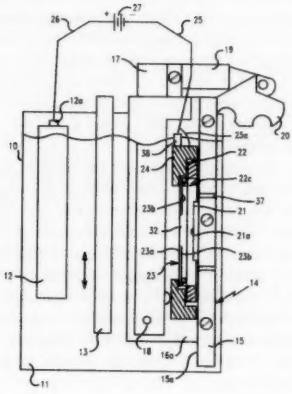
an anode in the electrolyte;

a cathode device comprising:

a planar dielectric plate having an inner and outer surface;

an inhibitor electrode attached to the inner surface of the plate;

a dielectric clamp ring having a front surface and a back surface and a through opening and on which front surface a substrate is secured, the substrate having a front surface to be plated and a back surface which is secured to the front surface of the clamp and which through opening of the clamp ring is positioned overlying the inhibitor electrode with the clamp having a thickness sufficient to form a space between the back surface of the substrate to be plated and the unattached surface of the inhibitor electrode;



a cathode structure having a through opening and a lip onto which the ring and substrate are positioned; and

means to force the cathode structure, clamp and secured substrate against the inner surface of the plate;

positioning the clamp through opening and cathode structure through opening over the inhibitor electrode;

forcing and securing the cathode structure, substrate and clamp against the plate;

supplying energy to the plating system to provide a positive charge to the anode and a negative charge to the cathode structure and inhibitor electrode;

plating the substrate; and removing the plated substrate from the cathode device.

6,039,859

METHOD FOR ELECTROPLATING USING STABILIZED DISPERSIONS OF CONDUCTIVE PARTICLES

Wade Sonnenberg, Upton; Patrick J. Houle, Framingham; Thong B. Luong, Springfield; James G. Shelnut, Northboro, and Gordon Fisher, Sudbury, all of Mass., assignors to Shipley Company, L.L.C., Marlborough, Mass.

Division of application No. 08/626,636, Apr. 11, 1996, Pat. No. 5,800,739. This application May 20, 1998, Appl. No. 82,437.

Int. Cl.[7] **C25D** *5/02;5/54*

U.S. Cl. 205—159 **9 Claims**

1. A method for plating a metal over a substrate, said method comprising the steps of forming a conductive coating over said substrate by contacting said substrate with a stable aqueous dispersion of discrete graphite particles, said dispersion comprising said graphite particles dispersed in an aqueous medium and stabilized with a stabilizing quantity of a polymeric stabilizer having repeating alkylene oxide groups and a hydrophilic—lipophilic balance (HLB) in excess of 10 and thereafter, electroplating over said so formed conductive coating.

6,039,860

METHOD FOR CHROMIUM PLATING TITANIUM ALLOY

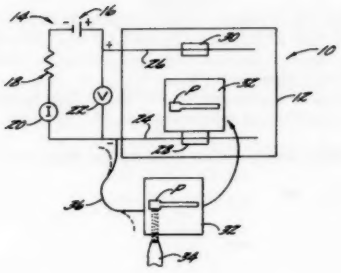
Austin M. Cooper, Aliso Viejo; Robert M. Hazencomb, Lake Forest; Albert W. Silva, Temecula, and Robert William Wright, Garden Grove, all of Calif., assignors to McDonnell Douglas Corporation, Seal Beach, Calif.

Filed Nov. 9, 1998, Appl. No. 188,731

Int. Cl.[7] **C25D** *5/34;5/52;* **C23C** *22/24*

U.S. Cl. 205—208 **16 Claims**

1. A method for chromium plating a surface of a part made of titanium or an alloy thereof, comprising:



mechanically cleaning the surface of the part to remove impurities therefrom;

electrically connecting the part to a negative terminal of a direct current power supply; and

while the part is connected to the negative terminal of the power supply, immersing the part in a bath of a chromium plating solution which contains an anode element connected to a positive terminal of the direct current power supply, and maintaining the part immersed for a period of time such that a plating of chromium is deposited on the surface of the part.

13. A method for chromium plating a surface of a part made predominantly of titanium, comprising the steps of:

degreasing the surface of the part;

after the degreasing step, grit-blasting the surface of the part;

within three minutes of completion of the grit-blasting step, electrically connecting the part to a negative terminal of a direct current power supply and thereafter immersing the part in a bath of chromic acid solution which contains an anode element connected to a positive terminal of the direct current power supply; and

maintaining the part immersed for a period of time such that a plating of chromium is deposited on the surface of the part.

6,039,861

ELECTROCHEMICAL REACTIONS

Brian Jeffrey Birch, Northants, and Nicholas Andrew Morris, Bedford, both of United Kingdom, assignors to Unilever Patent Holdings BV, Vlaardingen, Netherlands

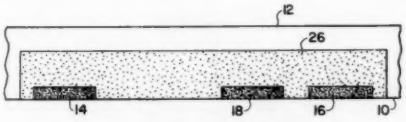
Continuation of application No. 08/464,715, filed as application No. PCT/GB93/02615, Dec. 21, 1993, Pat. No. 5,840,171. This application Nov. 16, 1998, Appl. No. 192,189.

Claims priority, application United Kingdom, Dec. 23, 1992, 9226840

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C25B** *15/02;1/24*

U.S. Cl. 205—335 **16 Claims**



1. An electrochemical reaction, wherein a controlled amount of a first reagent is generated electrochemically at an electrode in electrical contact with a solution of an electrochemically inert salt, comprising applying a suitable electrical potential to the electrode for a suitable time to generate a controlled amount of the first reagent by electrochemical reaction between the electrode and a species in solution producing a localised thin layer environment comprising the first reagent in the vicinity of the electrode; and monitoring the amount or presence of the first reagent or a further species produced in solution in response to production of the first reagent.

6,039,862

METHOD FEATURING A NON-CONSUMABLE ANODE FOR THE ELECTROWINNING OF ALUMINUM

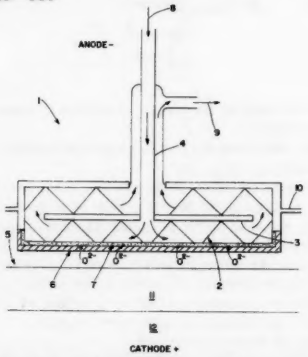
Robert A. Rapp, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Continuation of application No. 08/985,787, Dec. 5, 1997, Pat. No. 5,942,097. This application Jun. 24, 1999, Appl. No. 339,129.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C25C *3/06*

U.S. Cl. 205—386 **2 Claims**



1. A method of producing aluminum metal into a molten aluminum bath from alumina through the use of an electrochemically combustible fuel and an electric current, said method comprising electrochemically combusting said electrochemically combustible fuel with oxygen ions from said alumina so as to produce a flow of oxygen ions from said alumina while causing said electric current to flow from said molten aluminum bath, so as to produce aluminum from said alumina.

6,039,863

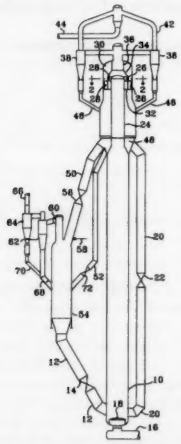
FLUIDIZED PARTICLE CONTACTING PROCESS WITH ELONGATED COMBUSTOR

Paolo Palmas, Des Plaines, Ill., assignor to UOP LLC, Des Plaines, Ill.

Provisional application No. 60/019,596, Jun. 17, 1996. This application May 9, 1997, Appl. No. 854,219.

Int. Cl.[7] C10G *11/00*

U.S. Cl. 208—113 **2 Claims**



1. A process for the fluidized catalyst cracking of hydrocarbons, said process comprising:

passing spent catalyst having coke contained thereon to a regeneration zone, contacting the coke-containing catalyst with an oxygen-containing gas at coke oxidation conditions and transporting the coke-containing catalyst upwardly in a combustor riser at a catalyst density of from 3 to 20 lb/ft^3 and a superficial gas velocity of at least 7 ft/sec while combusting essentially all coke from said catalyst to produce combustion gases and regenerated catalyst;

discharging regenerated catalyst and combustion gases tangentially from said combustor riser through discharge openings defined by at least two discharge arms into an outer portion of a separation vessel that surrounds said combustion riser and separating at least 98% of said regenerated catalyst from said combustion gases in said separation vessel by withdrawing separated combustion gases from an annular opening located between the discharge openings and the combustion riser and maintaining a diameter of the separation vessel in the location of the arms of 1.5 to 3 times the diameter of the adjacent combustion riser;

recovering combustion gases from said annular opening, passing said combustion gases directly from the annular opening to a cyclone separator to separate additional regenerated catalyst from said combustion gases and collecting separated regenerated catalyst from said combustion riser in a lower portion of said separation vessel;

passing regenerated catalyst downwardly from said separation vessel to the top of a reaction zone, contacting said regenerated catalyst therein with a hydrocarbon feedstock at catalytic cracking conditions while maintaining a contact time of 0.5 seconds or less and producing cracked product vapors and spent catalyst having coke deposited thereon; and

separating said cracked hydrocarbon vapors from said spent catalyst, recovering a cracked hydrocarbon product stream and returning spent catalyst to said regeneration zone by passing spent catalyst downwardly from the bottom of said reaction zone to the bottom of said combustion riser.

6,039,864

HYDROCARBON CONVERSION PROCESS USING A ZEOLITE BOUND ZEOLITE CATALYST

Gary David Mohr, League City, Tex., and Johannes Petrus Verduijn, Bertem, Belgium, assignors to Exxon Chemical Patents Inc., Houston, Tex.

Division of application No. 08/561,674, Nov. 22, 1995, Pat. No. 5,993,642, which is a continuation-in-part of application No. 08/344,034, Nov. 23, 1994, abandoned. This application May 19, 1998, Appl. No. 81,340.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C10C *5/52*

U.S. Cl. 208—134 **28 Claims**

1. A process of isomerizing a hydrocarbon feed containing an aromatic C_8 stream comprising ethylbenzene, xylene isomers, or mixtures thereof comprising contacting said feed under isomerization conversion conditions with a zeolite bound zeolite catalyst that does not contain significant amounts of non-zeolitic binder, said catalyst comprising:

(a) first crystals of a first zeolite selected from the group consisting of large pore zeolite and medium pore zeolite having an average particle size greater than about 0.1 micron average particle size; and,

(b) a binder comprising second crystals of a second zeolite selected from the group consisting of large pore zeolite and medium pore zeolite having an average particle size less than said first crystals; wherein said second crystals are intergrown and form a coating or partial coating in said first crystals.

6,039,865

REMOVAL OF PHOSPHATES FROM HYDROCARBON STREAMS

Shaun T. E. Mesher, Calgary, Canada, assignor to Trisol Inc., Calgary, Canada

Filed Nov. 13, 1998, Appl. No. 191,750

Claims priority, application Canada, Dec. 19, 1997, 2225297; Nov. 3, 1998, 2252686

Int. Cl.[7] C10G *45/00;19/00;29/04;* C07G *7/12;* C04B *35/03*

U.S. Cl. 208—263 6 Claims

1. A method for removing phosphates from a hydrocarbon stream, the method comprising the step of contacting the hydrocarbon stream with a ceramic formed from a basic material selected from the group consisting of alkaline earth compounds, alkaline metal compounds, group IIA element compounds, group IVA element compounds and group VIA element compounds, wherein the ceramic chemically reacts with phosphates in the hydrocarbon stream and binds to the phosphates, thus removing them from the hydrocarbon stream.

6,039,866

FLUIDIZED BED FILTERING APPARATUS

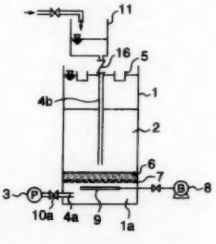
Tetsuya Tanaka, Ibaraki-ken; Koichi Tsuzuki, Tsuchiura; Noriyo Nishijima; Fumitaka Handa, both of Ibaraki-ken, and Shiro Nakadaira, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1998, Appl. No. 48,074

Claims priority, application Japan, Mar. 26, 1997, 9-073058

Int. Cl.[7] C02F *3/08*

U.S. Cl. 210—136 15 Claims



1. A fluidized bed filtering apparatus in which original water to be treated is passed upwardly through a filtering chamber filled with granular filtering material so that the granular filtering material is fluidized by the flow of the water and the water is purified, comprising

a supporting layer disposed in said filtering chamber for supporting a filtering material layer made of said granular filtering material and providing a space in the lower portion of said filtering chamber,

a first feed pipe having an outlet within said space for feeding the original water to be treated,

a second feed pipe having an outlet in said filtering material layer for feeding the original water to be treated,

a pump connected to said first feed pipe for forcedly feeding pressurized water into said space under said supporting layer, and

a head tank connected to said second feed pipe for feeding the original water to be purified from said head tank into said filtering material by free fall with gravity.

6,039,867

DEVICE FOR CONTINUOUS DISINTEGRATION OF ACTIVATED SLUDGE

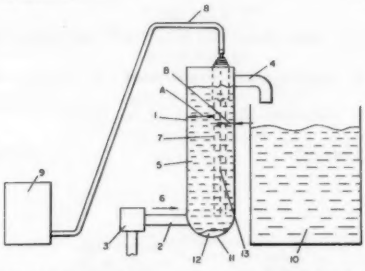
Karl Frei, Wil, Switzerland, and Klaus Luger, Reichlung Ludenhausen, Germany, assignors to Telesonic AG, Bronschhofen, Switzerland

Division of application No. 08/861,171, May 21, 1997, Pat. No. 5,895,577. This application Apr. 19, 1999, Appl. No. 293,871.

Claims priority, application Switzerland, May 23, 1996, 1300/96

Int. Cl.[7] C02F *11/12*

U.S. Cl. 210—173 8 Claims



1. A device for continuous treatment of microbial sludge said device comprising a treatment vessel and a sonic source for generating ultrasonic emissions arranged within said treatment vessel, wherein

the sonic source is arranged eccentrically within the treatment vessel,

the treatment vessel is formed as a pipe having inner walls

the ultrasonic emission of the sonic source is directed towards the walls of the pipe, and

the walls of the pipe are formed as reflectors for the ultrasonic emissions impacting from the sonic source, wherein the treatment vessel possesses a microbial sludge feed pipe, and a outlet pipe for treated microbial sludge, and wherein the sonic source is eccentrically located with respect to the vessel to avoid mutual nullification of sonic waves reflected from the walls and radiated from the source.

6,039,868

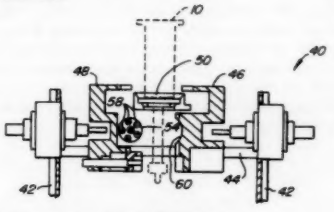
BLOOD SEPARATOR SYSTEM

Michael P. Allen, Los Altos; Stoughton L. Ellsworth, Palo Alto; Lawrence M. Ensler, Los Altos, and Kumar Subramanian, Pleasanton, all of Calif., assignors to First Medical, Inc., Mountain View, Calif.

Continuation of application No. 08/386,242, Feb. 9, 1995, abandoned. This application Apr. 16, 1997, Appl. No. 839,879.

Int. Cl.[7] B01D *36/00*

U.S. Cl. 210—232 2 Claims



1. A blood separator system comprising:

a blood separation device including a flexible tube, a needle structure at an inlet end of the flexible tube, and a filter member at an outlet end of the flexible tube; and

a blood separation driver including a frame, wherein the frame comprises a collar for supporting the inlet end of the flexible tube and one or more rods which extend laterally from the collar, a clamp for removably securing the blood separation

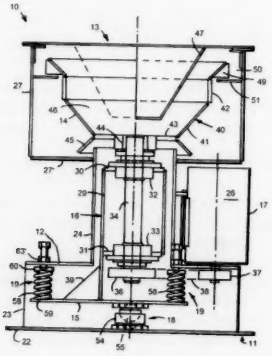
device, wherein said clamp comprises first and second opposed clamping elements at least one of which is translatably mounted on the rods, a peristaltic drive wheel which is mounted on at least one of the clamping elements and engages an exterior surface of the flexible tube to pass blood through a lumen thereof when the tube is secured in the clamp, and at least one motor for translating one or both of the clamping elements to selectively secure and release the flexible tube when in place in the collar.

6,039,869

SUPPORT ARRANGEMENT FOR CENTRIFUGAL CHIP SEPARATOR

Russell D. Dudley, 10215 Cricklewood Ct., Portage, Mich. 49024

Filed Sep. 28, 1998, Appl. No. 161,901
Int. Cl.[7] B04B *1/00*
U.S. Cl. 210—232 **21 Claims**



1. A centrifugal chip separator comprising:

a base having a bottom and a raised platform;

a centrifuge device adapted to separate liquid from liquid-laden metal scrap by centrifugal force, the centrifuge device including a centrifuge support plate located below the raised platform, but above the bottom;

a mount operably supporting the centrifuge support plate on the bottom for limited non-axial movement as the centrifuge device is operated; and

a plurality of biasing devices extending between the centrifuge support plate and the raised platform that press against the raised platform to bias the centrifuge support plate downwardly away from the raised platform and against the mount, the biasing devices being spaced apart at locations around the mount and being adjustable so that the biasing devices can be adjusted to an optimal pressure for counteracting non-axial forces and vibrations generated as the centrifuge device is operated, the biasing devices including springs constructed to bias the centrifuge support plate downwardly from the raised platform and against the mount.

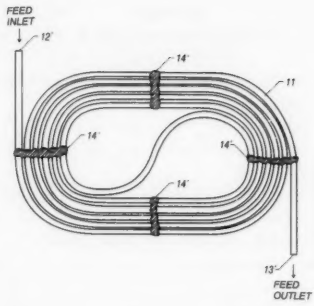
6,039,870

RADIAL WOUND FIBER DISK

Arye Z. Gollan, 110 Oxford Rd., Newton, Mass. 02159

Filed May 5, 1998, Appl. No. 72,718
Int. Cl.[7] B01D *63/02;63/04;63/10;633/12*
U.S. Cl. 210—321.61 **13 Claims**

1. A radially wound tubular fiber disk comprising at least one strand of hollow fiber membrane having a feed inlet at one end and



a feed outlet at the other and forming a spiral having a plurality of adjacent convolutions in a plane,

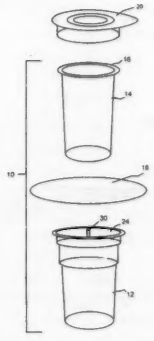
and radially arranged seams forming bonds that maintain a desired spacing between adjacent convolutions and hold the spiral structure in place.

6,039,871

SMALL DIALYSIS DEVICE

Laura L. Sykaluk, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed Sep. 25, 1998, Appl. No. 161,328
Int. Cl.[7] B01D *63/00*
U.S. Cl. 210—321.71 **6 Claims**



1. A device useful for the dialysis of small samples of fluids comprising:

a cylindrical outer sleeve having an open top end and an open bottom end, the sidewall portion of the sleeve near the top end containing a channel in and around the inner surface with said sidewall extending upwardly from said channel toward said open top end;

a cylindrical inner sleeve having an open, flanged top end and an open bottom end, said inner sleeve being positioned within and in axial alignment with said outer sleeve with the flange being inserted in the channel of the outer sleeve and the sidewall adjacent to the bottom end of the inner sleeve extending below the bottom end of the outer sleeve, there being a space between the sidewalls of the sleeves in the region adjacent to the bottom end of the outer sleeve; and

a dialysis membrane covering the open, bottom end of the inner sleeve and extending upwardly and around the sidewall of the said sleeve so as to fill said space between the sidewalls of the two sleeves and secure the sleeves in an air tight relationship in said region.

6,039,872

HYDROPHILIC MEMBRANE

Xiaosong Wu, Pensacola; Joel Shertok, Pace, and Peter Konstantin, Gulf Breeze, all of Fla., assignors to Pall Corporation, East Hills, N.Y.

Continuation-in-part of application No. 08/958,654, Oct. 27, 1997. This application Apr. 10, 1998, Appl. No. 58,631.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B01D** *39/00*

U.S. Cl. 210—500.35 **40 Claims**

1. A hydrophilic membrane having a pore rating from about 0.02 μm to about 10 μm, said membrane comprising a network of a non-crystalline hydrophobic polymer selected from the group consisting of polyethersulfone and polysulfone, and a hydrophilic acrylate polymer derived from a polyalkylene glycol diacrylate defined by two acrylate groups attached by ester linkages at opposite ends of a hydrophilic polyalkylene glycol chain having a molecular weight of at least about 200 and, optionally, a hydrophilic monoacrylate.

6,039,873

PROCESS FOR THE THOROUGHGOING AEROBIC BIOLOGICAL PURIFICATION OF WASTE WATER

Theo Stähler, Niederzeuzheim - Mühlenhof, D-65589 Hadamar 2, Germany

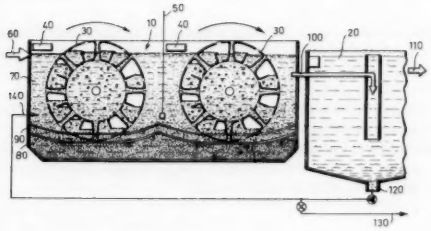
PCT No. PCT/EP97/00411, § 371 Date Sep. 11, 1998, § 102(e) Date Sep. 11, 1998, PCT Pub. No. WO97/28094, PCT Pub. Date Aug. 7, 1997

PCT Filed Jan. 30, 1997, Appl. No. 117,614

Claims priority, application Germany, Feb. 2, 1996, 196 03 690

Int. Cl.[7] **C02F** *3/00;3/30*

U.S. Cl. 210—605 **17 Claims**



1. A method for biological purification of wastewater as well as mechanical presettled wastewater, comprising the steps: degrading biologically nitrogen and phosphorous compounds in a biotank; operating said biotank with suspended activated sludge and with fixed film biomass for producing purified water directly removable from said biotank; controlling and regulating oxygen input to said biotank for operating said biotank under different oxygen environmental conditions; forming an aerobic zone near a water surface in said biotank; forming an anoxic zone near a bottom of said biotank, said aerobic zone and said anoxic zone being connectable with one another by at least one transition zone; and producing a total concentration exceeding 3 kilograms of dry solids per cubic meter of suspended activated sludge and fixed film biomass in used tank volume.

6,039,874

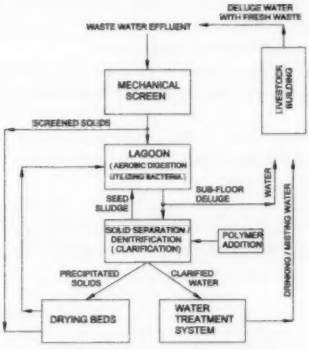
APPARATUS AND METHOD FOR PURIFICATION OF AGRICULTURAL ANIMAL WASTE

Alfredo J. Teran, Cape Canaveral; John R. Derrick, Jr., Rockledge; Nidal A. Samad, Merritt Island; W. Todd Willoughby, Cape Canaveral, and Richard G. Wood, Merrit Island, all of Fla., assignors to AJT & Associates, Inc., Cape Canaveral, Fla.

Provisional application No. 60/061,397, Oct. 7, 1997, Provisional application No. 60/070,410, Jan. 5, 1998, Provisional application No. 60/070,709, Jan. 7, 1998, Provisional application No. 60/079,360, Mar. 25, 1998. This application Oct. 6, 1998, Appl. No. 167,275.

Int. Cl.[7] **C02F** *3/30*

U.S. Cl. 210—605 **8 Claims**



4. A method for treatment of agricultural animal wastewater, which comprises the following sequential steps:

screening wastewater influent to remove bulk solids;

pressing said bulk solids to remove excess moisture and directing the removed moisture to an aerobic lagoon for treatment;

aerobically treating said wastewater in an aerobic lagoon said aerobic lagoon further comprises propagated aerobic bacteria selected to aerobically digest animal wastewater;

diverting a portion of said aerobically treated wastewater to deluge tanks for use in flushing livestock buildings;

injecting said aerobically treated wastewater with a polymer blend prior to its entering a plurality of above-ground clarifying means;

clarifying and denitrifying said wastewater in the plurality of above-ground tanks whereby suspended solids are precipitated and a portion thereof diverted to a plurality of drying beds for drying;

returning a portion of clarified supernatant to the aerobic lagoon;

filtering water flowing from the clarifying means prior to disinfecting with ozone;

treatment of said clarified water with ozone to provide drinking water suitable for agricultural animals.

6,039,875

COMPOSITION AND METHOD FOR REMOVING SUSPENDED SOLIDS FROM WASTEWATER

John A. Christiansen, and Erik Rumbaugh, both of Baton Rouge, La., assignors to Interbio, Inc., Baton Rouge, La.

Filed Nov. 17, 1997, Appl. No. 971,348

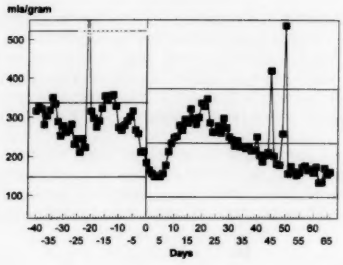
Int. Cl.[7] **C02F** *1/56;3/12*

U.S. Cl. 210—606 **85 Claims**

1. A method of removing suspended solids from an aqueous solution comprising:

establishing turbulent conditions in said aqueous solution;

adding to said solution cultures of exo-polymer producing bacteria capable of incorporating phosphate in Poly-β-Hydroxybutyrate storage polymers to said solution and capable of producing at least about 0.4 grams of exo-polymer



for each gram of exo-polymer producing bacteria wherein said exo-polymers are capable of capturing said suspended solids in said turbulent conditions;

establishing sufficient levels of dissolved oxygen in said solution to support the production of said exo-polymers by said bacteria;

establishing sufficiently low BOD_5 levels in said solution to stimulate the production of said exo-polymers by said bacteria; and

establishing non-turbulent conditions in said aqueous solution whereby said exo-polymer producing bacteria and their captured suspended solids may flocculate and settle.

6,039,876

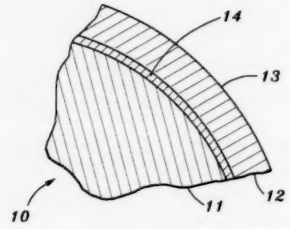
HYDROPHILIC POLYSTRENE DIVINYLBENZENE BASED MATRIXES FOR CHROMATOGRAPHY

Yan-Bo Yang, 12839 San Juan St., Victorville, Calif. 92392

Continuation of application No. 07/919,518, Jul. 24, 1992, abandoned. This application Sep. 22, 1994, Appl. No. 310,813.

Int. Cl.[7] B01D *15/08*

U.S. Cl. 210—635 **4 Claims**



1. The process for making a matrix for use in chromatography, said process comprising the following steps:

1. providing a substrate body comprising a polystyrene divinylbenzene copolymer with reactive groups, some of which are hydrophobic, and having a surface;

2. applying to said surface oligomer or polymer molecules, each said molecule including a plurality of hydroxy groups, whereby at least a plurality of said hydroxy groups of each said molecule form with a respective reactive group on said surface, a covalent bond, thereby chemically bonding each of said molecules to said surface at a plurality of respective locations on said surface, thereby to form a layer around said matrix, others of said hydroxy groups which did not react with said reactive groups causing the surface of said layer to be hydrophilic.

6,039,877

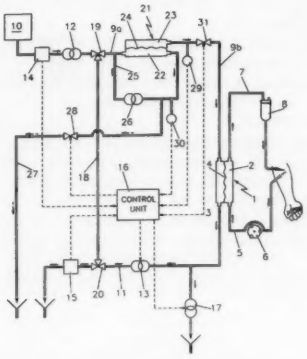
DEVICE AND METHOD FOR PREPARING A TREATMENT LIQUID BY FILTRATION

Jacques Chevallet, Serezin Du Rhone, and Jean-Claude Riquier, Rillieux, both of France, assignors to Hospal Industrie, Meyzieu, France

Division of application No. 08/462,435, Jun. 5, 1995, Pat. No. 5,702,597. This application Sep. 22, 1997, Appl. No. 934,903. Claims priority, application France, Jul. 26, 1994, 94-09499

Int. Cl.[7] B01D *61/00*

U.S. Cl. 210—636 **8 Claims**



1. A method for cleaning a filter having a first chamber and a second chamber separated by a filtering membrane, the first chamber having an outlet and having an inlet connected to a treatment liquid source, and the second chamber having an outlet for the filtered treatment liquid, the method comprising the steps of:

conveying treatment liquid from the source through the first chamber;

recirculating during a recirculation mode, all treatment liquid from the outlet of the first chamber to the inlet of the first chamber so that all treatment liquid exiting the first chamber is fed-back through a feedback line into the first chamber;

adding to the recirculating treatment liquid additional treatment liquid from the source;

measuring a clogging level of the filter;

comparing the measured clogging level with a predetermined clogging threshold;

intermittently purging during a purge mode, the first chamber when the measured clogging level reaches the predetermined clogging threshold;

measuring a frequency of purges of the first chamber;

comparing the measured purge frequency with a purge frequency reference value; and

increasing flow speed of treatment liquid through the first compartment when the measured purge frequency exceeds the purge frequency reference value.

6,039,878

RECOVERY OF VOLATILE ORGANIC COMPOUNDS FROM EMULSION OF VOLATILE ORGANIC COMPOUNDS IN WATER BY PERVAPORATION

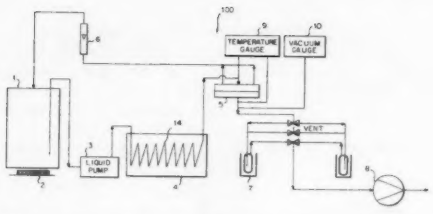
Subhas Sikdar, and Leland Vane, both of Cincinnati, Ohio, assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Provisional application No. 60/018,193, May 23, 1996. This application May 23, 1997, Appl. No. 862,308.

Int. Cl.[7] B01D *15/00*

U.S. Cl. 210—640 **13 Claims**

1. A method for removing volatile organic compounds from an emulsion comprising volatile organic compounds, water, and a



surfactant, wherein the continuous phase of said emulsion is water, comprising passing said emulsion through a hydrophobic pervaporation membrane.

6,039,879

METHOD FOR SEPARATING AND RECOVERING OBJECTIVE COMPONENT

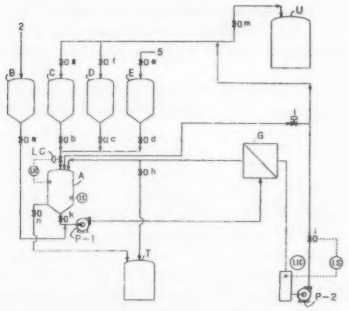
Yoichi Shimoi; Hideo Tamura; Masaomi Okazaki, and Takao Suganuma, all of Kanagawa, Japan, assignors to Nittetu Chemical Engineering Ltd., and Ajinomoto Co., Inc., both of Tokyo, Japan

Filed Oct. 20, 1997, Appl. No. 954,058

Claims priority, application Japan, Oct. 18, 1996, 8-311147; Sep. 4, 1997, 9-277881

Int. Cl.[7] B01D *61/00*

U.S. Cl. 210—641 **10 Claims**



1. A method for separating and recovering an objective component from a crude liquid by a membrane in time-lagged multi-stage washing operation, comprising:

at least two stages which comprise steps as follows:

a mixing step of mixing a washing liquid continuously or intermittently into a crude liquid stored in a container to form a mixture of said crude liquid and said washing liquid in each stage;

a separating step of separating said mixture in each stage into a permeated liquid and a residual liquid by passing said mixture through a membrane; and

a returning step of returning said residual liquid to said container in each stage;

wherein said separating step, and returning step are performed simultaneously;

wherein successive ones of said at least two stages are separated by a time lag; and

wherein successive ones of said at least two stages use washing liquids at different concentrations, in descending order, of the objective component concentration;

obtaining a first permeated liquid by the separating step in a first stage of said at least two stages of a cycle of the time-lagged multi-stage washing operation;

obtaining a final residual liquid by the separating step in a final stage of said at least two stages using a final washing liquid which has an objective component concentration of essentially zero; and

using a permeated liquid obtained by a membrane treatment other than the first permeated liquid, as a washing liquid in a later cycle performed on another crude liquid;

wherein said later cycle has the same number of stages as in said cycle, and

wherein said step of using a permeated liquid is carried out in a last stage of said later cycle.

6,039,880

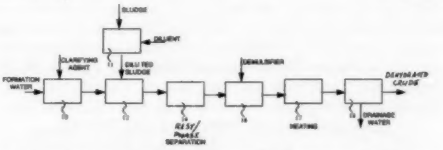
METHOD FOR DEHYDRATING A WASTE HYDROCARBON SLUDGE

Carmen Morataya, Caracas, Venezuela, assignor to Intevep, S.A., Caracus, Venezuela

Filed Feb. 24, 1998, Appl. No. 28,533

Int. Cl.[7] C02F *1/52*

U.S. Cl. 210—708 **15 Claims**



1. A method for dehydrating a waste hydrocarbon sludge, comprising the steps of:

(a) providing a waste hydrocarbon sludge comprising oil, water and sediment wherein the content of water and sediment is greater than or equal to about 10% vol;

(b) providing a formation water;

(c) adding to the formation water a clarifying agent in an amount of less than or equal to 250 ppm based on the volume of the formation water so as to provide a solution;

(d) washing the waste water hydrocarbon sludge by mixing the waste hydrocarbon sludge with the solution so as to provide a sludge-water mixture having a ratio of water to hydrocarbon of at least about 1:1;

(e) holding the sludge-water mixture at rest for at least two hours so as to obtain partial separation of water from oil to provide a partially dewatered sludge-water mixture;

(f) adding a demulsifier to the partially dewatered sludge-water mixture to provide a sludge-water-demulsifier mixture;

(g) heating the sludge-water-demulsifier mixture to a sufficient temperature and holding for a time sufficient to provide a hydrocarbon phase having a water content of less than or equal to about 1% vol.

6,039,881

SPRAY DRYING OF POLYMER-CONTAINING DISPERSIONS, WATER-IN-OIL AND WATER-IN-OIL MICROEMULSIONS AND DRY POLYMER PRODUCTS FORMED THEREBY

William Bloor Davies, Darien; John Edward Healy, Fairfield, both of Conn.; Gary Kaui Lani Miller, Port Chester, N.Y.; Joseph J. Kozakiewicz, Trumbull, and Roderick G. Ryles, Milford, both of Conn., assignors to CYTEC Technology Corp., Wilmington, Del.

Division of application No. 08/670,194, Jun. 21, 1996, and a continuation-in-part of application No. 08/479,057, Jun. 7, 1995. This application May 29, 1998, Appl. No. 87,089.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C02F *1/56*

U.S. Cl. 210—732 **9 Claims**

1. A method of treating suspended solids, comprising (a) intermixing substantially water-soluble or water-swellable polymer agglomerates with water to form an aqueous admixture, (b) intermixing said aqueous admixture with suspended solids, and (c) separating resultant concentrated solids from resultant aqueous liquid, wherein said agglomerates are comprised of polymer par-

ticles comprised of a spray-dried polymer having pendant groups selected from the group consisting of amide, tertiary aminomethyl, quaternized tertiary aminomethyl, hydroxyl, glyoxal, sulfonate, sulfonate salt, carboxylic acid, carboxylic acid salt, hydroxamic acid, hydroxamic acid salt, or a polymer having recurring units selected from the group consisting of dialkylaminoalkyl(alk)acrylate, dialkylaminoalkyl(alk)acrylate salts, and quaternized dialkylaminoalkyl(alk)acrylate, wherein about 90% of said agglomerates have an agglomerate size of about 160 microns or greater and wherein about 90% of said agglomerates have an agglomerate size of about 1500 microns or less.

6,039,882

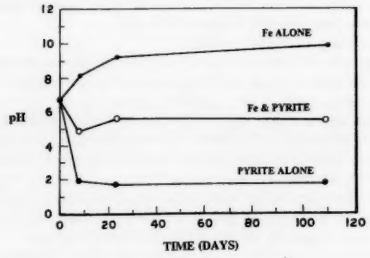
REMEDIATION OF ENVIRONMENTAL CONTAMINANTS USING A METAL AND A SULFUR-CONTAINING COMPOUND

N. Lee Wolfe, and Mark G. Cipollone, both of Athens, Ga., assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C., and Dyncorp, Inc., Reston, Va.

Provisional application No. 60/007,124, Oct. 31, 1995. This application Oct. 30, 1996, Appl. No. 739,842.

Int. Cl.[7] **C02F** *1/70*

U.S. Cl. 210—747 **9 Claims**



1. A method for the remediation of an environmental contaminant comprising reacting the contaminant with an alcohol, wherein the alcohol solubilizes the contaminants, and a reaction mixture comprising elemental iron and a sulfide-containing compound for a sufficient amount of time to cause chemical reduction of the contaminant, wherein the amount of the sulfide-containing compound is between 0.1% and 25% by weight of the mixture, and wherein the environmental contaminant is an organic compound.

6,039,883

COMPOUND METHOD FOR DISINFECTION OF LIQUIDS

Helmut I Milde, Boxford, and Sanborn F Philp, Pittsfield, both of Mass., assignors to Ion Physics Corporation, Atkinson, N.H.

PCT No. PCT/US96/12174, § 371 Date Jan. 7, 1998, § 102(e) Date Jan. 7, 1998, PCT Pub. No. WO97/05067, PCT Pub. Date Feb. 13, 1997

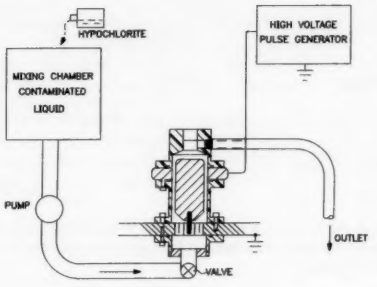
Provisional application No. 60/001,552, Jul. 27, 1995. This PCT application Jul. 25, 1996, Appl. No. 983,533.

Int. Cl.[7] **C02F** *1/461;* **A61L** *2/02*

U.S. Cl. 210—748 **14 Claims**

1. A process for disinfection of liquids comprising the following steps:

placing the contaminated liquid to be disinfected in an E-field processing chamber containing electrodes,



applying at least one voltage pulse across said electrodes of sufficient magnitude and number to have a disinfecting action on said liquid, and

adding to said liquid a disinfectant capable of increasing said disinfecting action produced by said voltage.

6,039,884

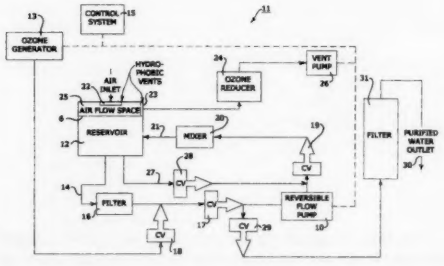
REVERSIBLE FLOW CIRCUIT FOR BATCH LIQUID PURIFIER

William Alan Burris, Pittsford, and Philip M. Prinsen, Ontario, both of N.Y., assignors to Alab, LLC, Pittsford, N.Y.

Filed Mar. 4, 1998, Appl. No. 34,710

Int. Cl.[7] **B01D** *11/04;* **C02F** *1/78*

U.S. Cl. 210—760 **27 Claims**



1. A purifier treating a batch of liquid with ozone, the purifier combining an ozone generator producing an ozone-containing gas, a controller, a pump, and a purification course, and the purifier comprising:

a. the pump being reversed in response to the controller after the pump has caused mixing of the ozone-containing gas into contact with the liquid and has directed ozonized liquid through the purification course; and

b. the pump withdrawing ozonized liquid from the purification course during reverse operation and redirecting the withdrawn ozonized liquid to a reverse destination.

9. A method of operating an ozone purifier that purifies a batch of liquid, the method using a purifier having an ozone generator producing an ozone-containing gas and a pumping system for contacting the liquid with the ozone-containing gas and directing ozonized liquid through a purification course, the method comprising:

after operating the purifier and the pumping system in a forward mode to direct ozonized liquid through the purification course, then reversing a pump in the pumping system to withdraw ozonized liquid from the purification course and redirect the withdrawn ozonized liquid to a reverse destination.

6,039,885

PROCESS AND DEVICE INTENDED FOR ULTRAFILTRATION OF PARTICLES IN FLUIDS

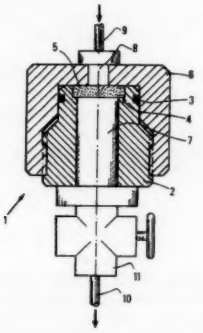
Emmanuel Behar, Jouy le Moutier, and Alexander Werner, Paris, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Sep. 29, 1997, Appl. No. 940,012

Claims priority, application France, Sep. 27, 1996, 96 11922

Int. Cl.[7] B01D *29/03*

U.S. Cl. 210—767 **13 Claims**



1. An ultrafiltration process for ultrafiltration of particles from fluids, comprising the steps of:

providing at least a first filtering element made from a source rock, said source rock having micropores having an average diameter of between 10–200 Angstroms;

passing fluids containing particles through said first filtering element; and

retaining particles having a diameter larger than said average diameter within said micropores.

6,039,886

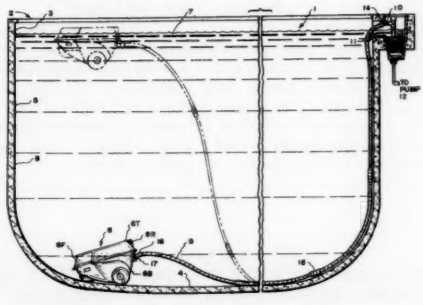
WATER SUCTION POWERED AUTOMATIC SWIMMING POOL CLEANING SYSTEM

Melvyn L. Henkin, 1001 Sharon La., and Jordan M. Laby, 1389 Beachmont, both of Ventura, Calif. 93001

Continuation-in-part of application No. PCT/US97/11302, Jun. 25, 1997. This application Dec. 26, 1997, Appl. No. 998,529.

Int. Cl.[7] C02F *1/40;* **E04H** *4/16*

U.S. Cl. 210—776 **43 Claims**



36. A method of cleaning both the interior wall surface of an open container and the water surface of a water pool contained therein, said method comprising:

placing a unitary body in said water pool;

utilizing a negative pressure to create a water flow in said body for producing a vertical force thereon to selectively move said body to either (1) proximate to said water surface or (2) proximate to said wall surface below said water surface;

urging said body against said wall surface when said body is proximate to said wall surface;

supporting said body proximate to said water surface when said body is proximate to said water surface; and

collecting pool water from (1) adjacent to said water surface when said body is proximate to said water surface and (2) adjacent to said wall surface when said body is proximate to said wall surface.

6,039,887

COLANDER WITH AN EXTENDED LATERAL STABILIZER PORTION

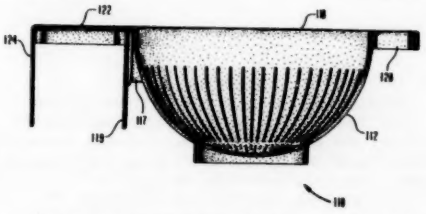
Yaffa Licari, 875 Ocean Ave., Elberon, N.J. 07740

PCT No. PCT/US95/12571, § 371 Date Mar. 27, 1997, § 102(e) Date Mar. 27, 1997, PCT Pub. No. WO96/10941, PCT Pub. Date Apr. 18, 1996

Continuation-in-part of application No. 08/316,099, Sep. 30, 1994, Pat. No. 5,505,850. This PCT application Sep. 29, 1995, Appl. No. 809,628.

Int. Cl.[7] B01D *24/22;29/00*

U.S. Cl. 210—800 **9 Claims**



1. A colander for rinsing and straining at a sink having a bottom surface and a sink portion having a back surface facing away from the sink, the colander comprising:

a bowl portion having an upper rim and a wall portion defining an inner surface and an outer surface on opposite sides thereof, said bowl portion including a plurality of perforations in said wall portion extending between said inner and outer surfaces,

an engagement portion for coupling said bowl portion to the sink, said engagement portion having;

a stabilizer portion coupled at a first end thereof to said bowl portion and extending laterally away from said bowl portion along a stabilizer plane which is substantially parallel with said upper rim; and

a coupler portion coupled to a second end of said stabilizer portion and having a coupler contact surface for communicating with the back surface of the sink portion, whereby the colander is supported therefrom with said bowl portion elevated above the bottom surface of the sink, and

a length adjustment arrangement disposed intermediate of said coupler contact surface of said coupler portion and said outer surface of said bowl portion for enabling continuous adjustment of a distance therebetween.

6,039,888

METHOD OF ETCHING AN ORGANIC ANTI-REFLECTIVE COATING

Jae Hee Ha, and Sun Ae Jun, both of Chungcheongbuk-do, Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

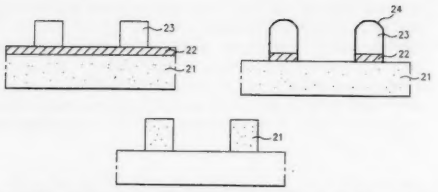
Filed Apr. 10, 1997, Appl. No. 827,694

Claims priority, application Rep. of Korea, Oct. 11, 1996, 96-45258

Int. Cl.[7] C23F *1/00*

U.S. Cl. 216—13 **4 Claims**

1. A method of etching an organic anti-reflective coating which comprises:



forming an organic anti-reflective film on an etch layer formed on a semiconductor substrate;

coating a photoresist on the anti-reflective coating;

patterning the photoresist through exposure and development processes;

selectively removing the organic anti-reflective coating in a plasma environment free of N and F;

simultaneously etching the organic anti-reflective coating and the upper part of the photoresist; and

using the photoresist left on the patterned organic anti-reflective coating and the organic anti-reflective coating as a mask, the etch layer formed on the substrate is etched with the photoresist and the organic anti-reflective coating being removed at the same time.

6,039,889

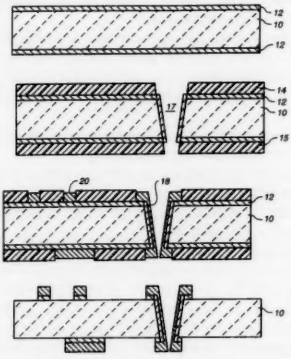
PROCESS FLOWS FOR FORMATION OF FINE STRUCTURE LAYER PAIRS ON FLEXIBLE FILMS

Lei Zhang, San Jose; William Chou, Cupertino; Michael G. Peters, Santa Clara, and Solomon I. Beilin, San Carlos, all of Calif., assignors to Fujitsu Limited, Japan

Filed Jan. 12, 1999, Appl. No. 229,502

Int. Cl.[7] H05K *3/02*

U.S. Cl. 216—17 **20 Claims**



1. A method of manufacturing a flexible circuit board from a dielectric substrate having conductive layers disposed on both sides of the substrate, the method comprising the steps of:

(a) forming a layer of photoresist on one of the conductive layers, wherein the conductive layer upon which the layer of photoresist is deposited is an underlying conductive layer;

(b) forming an aperture passing through the layer of photoresist, the underlying conductive layer, and the dielectric substrate;

(c) exposing the layer of photoresist to a pattern of actinic radiation;

(d) forming conductive material within the aperture;

(e) once steps (b), (c), and (d) have been performed, developing the exposed photoresist layer to expose portions of the underlying conductive layer;

(f) once step (e) has been performed, defining at least one conductive trace using the underlying conductive layer, and using the developed photoresist layer as a mask, the conductive trace being electrically connected to the conductive material within the aperture; and

(g) once step (f) has been performed, removing said developed photoresist layer.

6,039,890

QUICK ACTING ICE MELTER COMPOSITION

Kenneth C. Ossian, Bettendorf, and Norbert J. Steinhauser, Dubuque, both of Iowa, assignors to Ossian, Inc., Davenport, Iowa

Filed Jun. 16, 1999, Appl. No. 334,095

Int. Cl.[7] C09K *3/18*

U.S. Cl. 252—70 **8 Claims**

1. A quick melting ice melter composition comprising:

an effective amount of an ice melter; and

a small but melt speed enhancing effective amount of an ice melter compatible surface agent;

whereby the ice melter compatible surface active agent is coated upon the ice melter.

6,039,891

MULTI-OXIDIZER PRECURSOR FOR CHEMICAL MECHANICAL POLISHING

Vlasta Brusic Kaufman, Geneva, and Shumin Wang, Naperville, both of Ill., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of application No. 08/800,562, Feb. 18, 1997, which is a continuation-in-part of application No. 08/718,937, Sep. 24, 1996, Pat. No. 5,783,489. This application Jul. 11, 1997, Appl. No. 890,778.

Int. Cl.[7] C09K *13/00*

U.S. Cl. 252—79.1 **2 Claims**

1. A chemical mechanical polishing composition precursor comprising urea; from about 1.0 to about 9.0 wt % alumina, from about 0.2 to about 10.0 wt % ammonium persulfate and from about 0.5 to about 5.0 wt % succinic acid.

6,039,892

OXYGEN ABSORBENT COMPOSITION

Tomoharu Himeshima, Chiba-ken; Kazumoto Nakagawa; Tatsuo Iwai, both of Tokyo, and Takayuki Watanabe, Chiba-ken, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 9, 1999, Appl. No. 246,844

Claims priority, application Japan, Feb. 18, 1998, 10-035988

Int. Cl.[7] C09K *15/04;15/26;* **B01J** *19/00*

U.S. Cl. 252—188.28 **8 Claims**

1. An oxygen absorbent composition comprising an organic oxygen absorbent (A) which neither absorbs nor releases moisture and in which an oxidizable main component is supported on a porous silicate having an average pore diameter of 200 to 5,000 Å, and a formaldehyde absorbent (B) which neither absorbs nor releases moisture and is at least one of an amine, a thiol and a sulfonic acid that is supported on a porous carrier.

6,039,893

GUEST-HOST LIQUID CRYSTAL DISPLAY DEVICE AND GUEST-HOST LIQUID CRYSTAL COMPOSITION

Seiichi Arakawa; Masataka Matsute, both of Kanagawa, and Yasutoshi Kawate, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

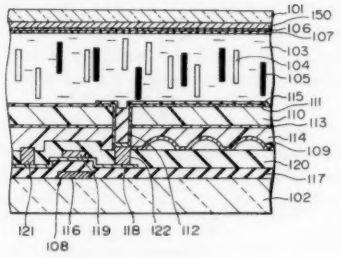
Filed Jan. 22, 1998, Appl. No. 12,014

Claims priority, application Japan, Jan. 24, 1997, 9-026183

Int. Cl.[7] C09K *19/60;19/52*

U.S. Cl. 252—299.01 **22 Claims**

1. A guest-host liquid crystal display device comprising:

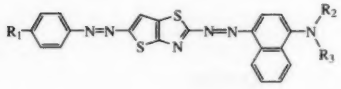


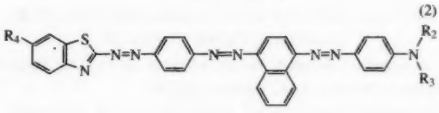
a pair of substrates opposing each other with a space therebetween;

a guest-host liquid crystal held in said space, said guest-host liquid crystal containing a mixture of dichroic dyes exhibiting a black color as a whole, said mixture of dichroic dyes is present in an amount less than or equal to 5 percent by weight; and

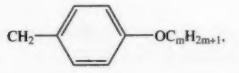
electrodes provided on said substrates for applying a voltage to said guest host liquid crystal;

said mixture of dichroic dyes comprising a bis-azo blue dye having a thienothiazole ring represented by the following chemical formula (1) and a tris-azo bluish purple dye having a benzothiazole ring represented by the following chemical formula (2):

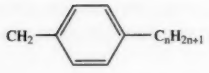

(1)


(2)

wherein R_1 is a hydrogen or halogen atom, C_nH_{2n+1}, COC_nH_{2n+1}, $OCOC_nH_{2n+1}$, $COOC_nH_{2n+1}$, or $CH_2COOC_nH_{2n+1}$, wherein n is an integer from 1 to 8; each of R_2 and R_3 is a hydrogen atom or C_nH_{2n+1}; R_3 may be



or



and a combination of R_2 and R_3 may form

wherein n is an integer from 1 to 8, and m is an integer from 1 to 5; and R_4 is a hydrogen or halogen atom, or C_nH_{2n+1}, wherein n is an integer from 1 to 8.

6,039,894

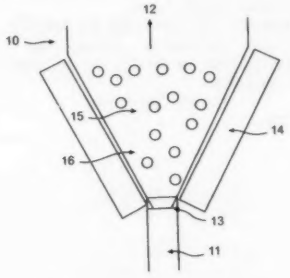
PRODUCTION OF SUBSTANTIALLY MONODISPERSE PHOSPHOR PARTICLES

Angel Sanjurjo, San Jose; Kai-Hung Lau, Cupertino; David Lowe, Hayward; Anastasia Canizales, San Francisco; Naixiong Jiang, Palo Alto; Victor Wong, Daly City; Liqiang Jiang, San Jose; Luke V. Schneider, Half Moon Bay; Naheed Mufti, Castro Valley; Robert T. Rewick, Mountain View, all of Calif.; Marie Johansson, Watchung, N.J., and Keith Kardos, Bethlehem, Pa., assignors to SRI International, Mento Park, Calif., and STC Technologies, Bethlehem, Pa.

Filed Dec. 5, 1997, Appl. No. 986,196

Int. Cl.[7] C09K *11/00*

U.S. Cl. 252—301.4 R **41 Claims**



1. A method for producing activated, substantially monodisperse, phosphorescent particles comprising the steps of:

suspending substantially monodisperse, phosphor-precursor particles in a fluidizing gas;

introducing a reactive gas to contact the suspended phosphor-precursor particles;

heating the suspended phosphor-precursor particles to a reaction temperature sufficient to form unactivated phosphorescent particles;

discontinuing the introduction of the reactive gas; and

activating the unactivated phosphorescent particles suspended within the fluidizing gas by heating the unactivated phosphorescent particles to an activation temperature to form activated, substantially monodisperse, phosphorescent particles, wherein the activation temperature is greater than or equal to the reaction temperature and wherein the reaction temperature ranges from about 500 to about 900° C.

6,039,895

BENZOQUINONEIMINES AS VINYL AROMATIC POLYMERIZATION INHIBITORS

Howard Stephen Friedman, 150 Forest Hill Rd., North Haven, Conn. 06473, and Paul Edwin Stott, 20 Clearview Dr., Sandy Hook, Conn. 06482

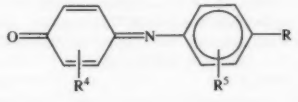
Continuation of application No. 08/053,958, Apr. 27, 1993, abandoned, which is a continuation of application No. 07/600,056, Oct. 18, 1990, abandoned. This application Jul. 18, 1994, Appl. No. 276,685.

Int. Cl.[7] C09K *15/00*

U.S. Cl. 252—404 **10 Claims**

1. A polymerization inhibitor system comprising an N-phenyl-1,4-benzoquinoneimine compound having the formula:

I



wherein R is NR^1R^2; wherein R^1 is C_1–C_8 alkyl and R^2 is selected from the group consisting of hydrogen, C_1–C_8 alkyl, C_6–C_{10} aryl, C_7–C_{16} alkaryl and C_3–C_8 cycloalkyl; and R^4 and R^5 are independently selected from the group consisting of hydrogen, C_1–C_8 alkyl, C_4–C_8 cycloalkyl, C_6–C_{10} aryl and C_7–C_{16} alkaryl.

6,039,896

ANISOTROPIC CONDUCTIVE ADHESIVE AND METHOD FOR PREPARATION THEREOF AND AN ELECTRONIC APPARATUS USING SAID ADHESIVE

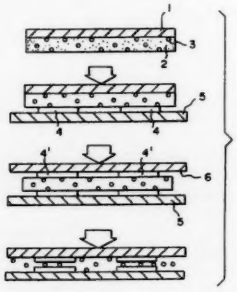
Tetsuya Miyamoto, Higashimine-machi, and Masakazu Kawata, Utsunomiya, both of Japan, assignors to Sumitomo Bakelite Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1999, Appl. No. 268,312

Claims priority, application Japan, Mar. 18, 1998, 10-068530; May 22, 1998, 10-141471; Oct. 13, 1998, 10-291101; Dec. 14, 1998, 10-354953

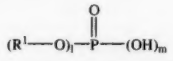
Int. Cl.[7] H01B *1/06*

U.S. Cl. 252—511 **14 Claims**



1. An anisotropic conductive adhesive comprising conductive particles dispersed in a resin composition, wherein said resin composition comprises a radical polymerization resin (A), an organic peroxide (B), a thermoplastic elastomer (C) and a phosphoric ester (D) represented by formula (1)

(1)



wherein R^1 is $CH_2{=}CR_1CO(OR_2)_n$ where R_1 is —H or —CH_3, R_2 is —C_2H_4—, —C_3H_6—, —$CH_2CH(CH_3)$—, —C_4H_8—, —C_5H_{10}—, —C_6H_{12}— or —C_2H_4—O—CO—C_5H_{10}— and n is an integer of 1–10; l is 1 or 2 and m is 1 or 2.

6,039,897

MULTIPLE PATTERNED STRUCTURES ON A SINGLE SUBSTRATE FABRICATED BY ELASTOMERIC MICRO-MOLDING TECHNIQUES

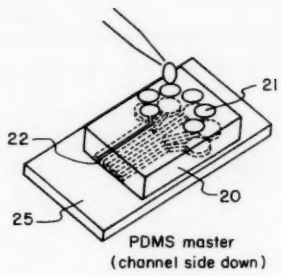
Michael J. Lochhead, and Paul Yager, both of Seattle, Wash., assignors to University of Washington, Seattle, Wash.

Provisional application No. 60/024,771, Aug. 28, 1996. This application Aug. 28, 1997, Appl. No. 919,464.

Int. Cl.[7] B29D *11/00*

U.S. Cl. 264—1.24 **40 Claims**

1. A method for patterning a material onto a substrate which comprises the steps of:



a. providing a micro-mold having a plurality of non-communicating, independent channels and having a plurality of reservoirs for receiving a micro-molding fluid each of which reservoirs communicates with a channel, said mold comprising an elastomeric master having a surface with a plurality of recesses therein and a substrate, said mold formed by contacting the surface of said elastomeric master with said substrate such that the recesses in said surface form said plurality of reservoirs and channels;

b. introducing a micro-molding fluid into said mold reservoirs filling said communicating channels; and

c. solidifying said fluid in said mold and removing said elastomeric master thereby generating a pattern of material on said substrate.

6,039,898

OPTICAL MEMORY DEVICE AND A METHOD FOR MANUFACTURING THEREOF

Boris Glushko, Ashdod, Israel, assignor to O.M.D. Optical Memory Devices, Ltd., Rehovot, Israel

Provisional application No. 60/045,985, May 8, 1997. This application Oct. 22, 1997, Appl. No. 956,052.

Int. Cl.[7] B29D *11/00*

U.S. Cl. 264—1.33 **21 Claims**

1. A method of manufacturing an optical memory device having a data layer formed on a substrate, the method comprising the steps of:

(a) forming an upper surface of the transparent substrate with a pattern having a plurality of spaced-apart regions which are capable of holding a fluorescent material;

(b) supplying the fluorescent material onto the patterned surface of the substrate, wherein said supplying is carried out whilst rotating the substrate in a predetermined manner such that the fluorescent material fills said spaced-apart regions and is removed from the spaces between the regions, wherein said predetermined manner is defined by properties of the fluorescent material and those of the substrate.

6,039,899

CONSOLIDATED CONTACT LENS MOLDING

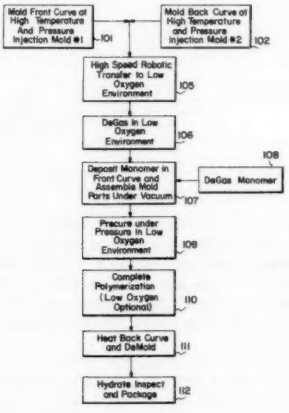
Wallace Anthony Martin, Orange Park; Jonathan Patrick Adams, Jacksonville, both of Fla.; Finn Thrige Andersen, Vedbaek, Denmark; Stephen Robert Beaton, Neptune Beach, Fla.; Svend Christensen, Allinge, Denmark; Allan G. Jensen, Hørsholm, Denmark; Ture Kindt-Larsen, Holte, Denmark; Victor Lust, Jacksonville, Fla.; Craig William Walker, Jacksonville, Fla., and Daniel Tsu-Fang Wang, Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of application No. 08/461,887, Jun. 5, 1995, abandoned, which is a division of application No. 08/258,654, Jun. 10, 1994, Pat. No. 5,804,107. This application Jan. 9, 1998, Appl. No. 5,277.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B29D** *11/00*

U.S. Cl. 264—1.36 **99 Claims**


Mold Front Curve at High Temperature And Pressure Injection Mold #1
101
Mold Back Curve at High Temperature and Pressure Injection Mold #2
102
High Speed Robotic Transfer to Low Oxygen Environment
105
DeGas in Low Oxygen Environment
106
108
Deposit Monomer in Front Curve and Assemble Mold Parts Under Vacuum
DeGas Monomer
107
Precure under Pressure in Low Oxygen Environment
109
Complete Polymerization (Low Oxygen Optional)
110
Heat Back Curve and DeMold
111
Hydrate Inspect and Package
112

1. An apparatus for the automated manufacturing of contact lenses from a polymerizable hydrogel in a low oxygen environment, said apparatus comprising;

(a) a molding station for injection molding fully degassed first and second polyolefin plastic mold parts for the production of soft contact lenses,

(b) an enclosure for receiving said mold parts from said molding station and maintaining said mold parts in an inert gas environment for a period sufficient to remove substantially all of the oxygen from within the plastic mold parts,

(c) a first automated station for receiving a plurality of first plastic mold parts and depositing therein a predetermined amount of a polymerizable hydrogel;

(d) a second automated station for receiving said plurality of first plastic mold parts and assembling each first mold part with a second plastic mold part with said polymerizable hydrogel in a cavity formed therebetween;

(e) a radiant energy source for polymerizing said polymerizable hydrogel in said cavity after said first and second halves are clamped together; and

(f) a third automated station for removing said second plastic mold part and any excess hydrogel from said first plastic mold part and said molded contact lens.

6,039,900

PARTICULATE POLYMERIC MATERIALS AND THEIR PRODUCTION

Kenneth Charles Symes, and Kishor Kumar Mistry, both of West Yorkshire, United Kingdom, assignors to Allied Colloids Limited, West Yorkshire, United Kingdom

Filed Jun. 30, 1998, Appl. No. 106,904

Claims priority, application United Kingdom, Jun. 30, 1997, 9713812

Int. Cl.[7] **B01J** *13/02;13/16*

U.S. Cl. 264—4.1 **15 Claims**

1. A process of making self-stabilising polymeric particles, the process comprising forming a dispersion in a first non-aqueous liquid of aqueous polymer particles having an outer surface which includes reactive groups and covalently reacting a reactive stabilising material with some of the reactive groups and thereby forming a dispersion of the particles with the stabiliser covalently bonded on to the outer surface of the particles wherein

said reactive stabiliser material is a copolymer of hydrophilic monomer units and hydrophobic monomer units.

6,039,901

ENZYMATICALLY PROTEIN ENCAPSULATING OIL PARTICLES BY COMPLEX COACERVATION

Jon C. Soper, Lebanon, and M. Teresa Thomas, Centerville, both of Ohio, assignors to Givaudan Roure Flavors Corporation, Cincinnati, Ohio

Filed Jan. 31, 1997, Appl. No. 791,953

Int. Cl.[7] **B01J** *13/10*

U.S. Cl. 264—4.3 **21 Claims**

1. A method of protein-encapsulating oil particles by complex coacervation comprising:

forming a dispersion in water of at least one positively charged protein colloid and at least one negatively charged colloid;

adding an oil to said dispersion and agitating to form a coarse emulsion of oil particles;

first forming a complex coacervate at ambient temperature;

cooling said complex coacervate to a gel temperature in the range of about 20° C. to about 27° C. to deposit a stabilized protein shell around said oil particles and further cooling to a temperature in the range of about 5° C. to 10° C. to stabilize said protein-encapsulated oil particles over a pH range of about pH 2 to about pH 10; and

enzymatically cross-linking said stabilized protein shell to form said protein-encapsulated oil particles.

6,039,902

METHODS OF RECYCLING CATALYST IN OXIDATIONS OF HYDROCARBONS

Ader M. Rostami, Bainbridge Island; David C. DeCoster, Buckley, both of Wash.; Eustathios Vassiliou, Newark, Del., and Mark W. Dassel, Indianola, Wash., assignors to RPC Inc., Atlanta, Ga.

Continuation-in-part of application No. 08/931,035, Sep. 16, 1997, which is a continuation-in-part of application No. 08/876,692, Jun. 16, 1997, which is a continuation-in-part of application No. 08/812,847, Mar. 6, 1997, and application No. 08/824,992, Mar. 27, 1997, Pat. No. 5,922,908, Provisional application No. 60/020,798, Jun. 24, 1996. This application Sep. 18, 1997, Appl. No. 932,875.

Int. Cl.[7] **C07C** *51/42;* **D01D** *1/02;5/08;* **D01F** *13/00*

U.S. Cl. 264—37.18 **38 Claims**

1. A method of maintaining catalyst in solution after water removal, outside a reaction zone, in a process comprising oxidation of a hydrocarbon by a gaseous oxidant to a respective intermediate oxidation product at an operation temperature in the reaction zone containing a mixture comprising the hydrocarbon, the catalyst, the water, a solvent, and an optional initiator, the method comprising sequential steps of:

(a) changing, outside the reaction zone, the operation temperature of the mixture to a second temperature below a precipitation temperature, at which and over which precipitation temperature, the catalyst in the first mixture precipitates, at least partially, if the water level in the first mixture is reduced to or under a precipitation water level, while the catalyst in the first mixture remains in solution if the water level in the first mixture is maintained above the precipitation water level;

(b) removing an amount of water from the first mixture, but maintaining the water level in the mixture over the precipitation water level at the second temperature;

(c) removing at least part of the intermediate oxidation product; and

(d) re-circulating the remaining mixture to the reaction zone.

6,039,903

PROCESS OF MAKING A BICOMPONENT FIBER

Diane R. Kent; Matthew B. Hoyt, both of Arden; Otto M. Ilg, Asheville, and Morris K. Queen, Clyde, all of N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Division of application No. 08/998,830, Dec. 29, 1997, Pat. No. 5,885,705, Provisional application No. 60/034,745, Jan. 10, 1997. This application Dec. 18, 1998, Appl. No. 216,682.

Int. Cl.[7] **D01D** *5/12;5/34;* **D01F** *8/06;8/12*

U.S. Cl. 264—40.1 **18 Claims**

1. A method of making a bicomponent fiber comprising directing respective melt flows of a polyamide and a contaminant-containing polymer to a spinneret, forming a bicomponent fiber by extruding the melt flows of the polyamide and the contaminant-containing polymer through orifices of the spinneret such that the contaminant-containing polymer is present as one domain of the fiber cross-section and the polyamide is present as another domain in the fiber cross-section, and thereafter quenching the bicomponent fiber, wherein the contaminant-containing polymer is polyamide and the contaminant in the contaminant-containing polymer is the cyclic dimer of caprolactam.

6,039,904

METHOD OF ADJUSTING A HEAT-DISPLACING T-DIE

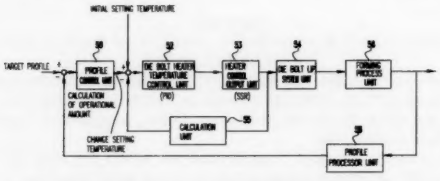
Satoru Nitta, and Koji Mizunuma, both of Shizuoka, Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1998, Appl. No. 25,444

Claims priority, application Japan, Feb. 14, 1997, 9-030911

Int. Cl.[7] **B29C** *47/00*

U.S. Cl. 264—40.5 **6 Claims**



1. A method of adjusting a heat-displacing T-die, wherein a T-die slit gap is adjusted by thermal expansion and contraction of die bolts individually provided with heaters so that a sheet or film material has a target profile in thickness, the method comprising the steps of:

providing a thickness feed back control loop, wherein the thickness feed back control loop calculates a target profile adjustment for the die bolts so as to define a spacing of the T-die slit gap based on a deviation between the target profile in thickness and a measured thickness profile of the sheet or film material;

providing a virtual temperature control loop, wherein the virtual temperature control loop predicts a temperature of the die bolts based on a control output value of the heaters and a radiation temperature to the circumference of the die bolts so as to calculate a power to be supplied to the heaters; and

controlling the die bolt temperature by supplying the power to the heaters thereby adjusting the T-die slit gap based on the steps of calculating a target profile adjustment and predicting the die bolt temperature.

6,039,905

APPARATUS AND METHOD FOR GRANULATING PLASTIC STRANDS

Ludwig Zollitsch, Korntal, and Ulrich Kreuz, Erdmannhausen, both of Germany, assignors to C.F.Scheer & Cie GmbH & Co., Stuttgart, Germany

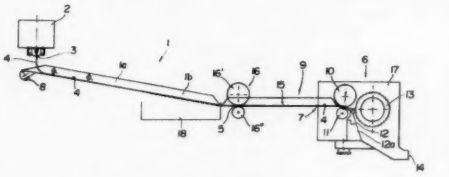
PCT No. PCT/EP95/04382, § 371 Date Jul. 23, 1997, § 102(e) Date Jul. 23, 1997, PCT Pub. No. WO96/14195, PCT Pub. Date May 17, 1996

PCT Filed Nov. 7, 1995, Appl. No. 817,824

Claims priority, application Germany, Nov. 7, 1994, 44 39 774

Int. Cl.[7] **B29C** *47/00;47/34*

U.S. Cl. 264—143 **24 Claims**



1. An apparatus for granulating plastic strands (**4**) which emerge from nozzles (**3**) in molten form and are supplied to a following, downward inclined runoff channel (**1**) in which the plastic strands are transported by a water stream, the apparatus further having a dewatering zone (**1***b*) for the plastic strands (**4**) and a granulator disposed after the dewatering-zone (**6**) for granulating the solidified plastic strands (**4**),

wherein between the dewatering zone (**1***b*) and the granulator (**6**) there is provided at least one temperature equalizing zone (**9**) comprising a temperature equalizing channel (**15**) arranged to cool the strands without adding external heat, the temperature equalizing zone having a minimum length such that the temperature differences of each of the plastic strands (**4**) across their respective cross section are largely equalized during their holding time in the temperature equalizing zone (**9**) in the absence of external heat to such an extent that they have a homogeneous degree of solidification across their cross section when entering into the granulator (**6**), and wherein a transport roll system (**16**) having a gap (**5**) is provided, said transport roll system engaging and further transporting the plastic strands (**4**) coming from the runoff channel (**1**) toward the granulator (**6**).

18. A method for granulating plastic strands which emerge from nozzles (**3**) in molten form, comprising the steps of:

supplying the molten strands (**4**) to a downwardly inclined runoff channel (**1**);

cooling and transporting the plastic strands (**4**) within the runoff channel (**1**) by a water stream;

dewatering the plastic strands (**4**) in a dewatering zone (**1***b*) of the runoff channel (**1**);

transporting the plastic strands (**4**) coming from the runoff channel (**1**) through a temperature equalization zone (**9**) comprising a temperature equalizing channel (**15**) toward a granulator (**6**) disposed after the temperature equalization zone (**9**) by means of a transport roll system (**16**) having a gap (**5**) for engaging and advancing the plastic strands (**4**);

equalizing temperature differences across the cross-section of the plastic strands (**4**) by moving the dewatered plastic strands (**4**) along a minimum length of the temperature equalizing channel (**15**) without adding external heat sufficient to cause

the plastic strands to each reach an equalized temperature across their respective cross-section to be in condition for granulation; and

granulating the plastic strands (**4**) with the granulator (**6**) disposed after the temperature equalization zone (**9**).

6,039,906

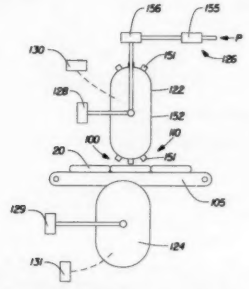
METHOD FOR APERTURING A LAMINATE

David Mark Sageser, Cincinnati, Ohio; Takuya Shirakawa, Akashi, and Koichi Morimoto, Hyogo, both of Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 29, 1997, Appl. No. 920,958

Int. Cl.[7] **B29C** *55/00;61/02;59/04*

U.S. Cl. 264—156 **6 Claims**



1. A method for aperturing a laminate, said laminate comprising at least one nonwoven web comprised of thermoplastic fibers, a thermoplastic film, and at least one elastic member, said method comprising the steps of:

a) forwarding said laminate through a pressure biased nip comprising a relief patterned nip defining member having a plurality of pattern elements and a nip defining anvil member;

b) biasing said nip defining members towards each other with a predetermined patterned-element pressure;

c) heating each nip defining member to a temperature that is sufficiently above the melt temperature of said thermoplastic fibers of said nonwoven web and above the melt temperature of said thermoplastic film and said elastic member to form an aperture in said laminate and to form an annular ring about the periphery of said aperture wherein said pressure between said nip members pushes said annular ring away from its center to stretch said annular ring; and

d) cooling and solidifying said annular ring to gather or pucker said annular ring so as to preserve the integrity of said aperture during subsequent stretching of the said laminate thereby yielding a higher total stretch capability of the said laminate before said annular ring tears.

6,039,907

METHOD FOR FINISHING AN EXTRUDED SEAL IN SITU ON A SHEET

Helmut Krumm, Aachen; Florenz Kittel, Wuerselen; Rolf Koette, Alsdorf, and Ralf Motzheim, Stolberg, all of Germany, assignors to Saint Gobain Vitrage, Courbevoie, France

PCT No. PCT/FR95/01685, § 371 Date Sep. 11, 1997, § 102(e) Date Sep. 11, 1997, PCT Pub. No. WO96/19339, PCT Pub. Date Jun. 27, 1996

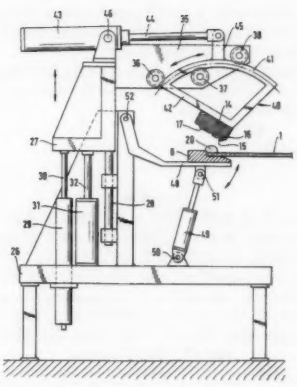
PCT Filed Dec. 18, 1995, Appl. No. 849,459

Claims priority, application Germany, Dec. 19, 1994, 44 45 258

Int. Cl.[7] **B29C** *37/00*

U.S. Cl. 264—161 **18 Claims**

1. Method for postforming a region of a section piece of material extruded on the surface of an object having an outer edge which



defines a periphery of the object, to form a profiled strip, the material of said section piece being malleable in said region, comprising the following steps:

placing over said region of said section piece a mould having a cavity corresponding to a desired shape of the post formed-profiled strip;

forming the malleable material in said region by closing the mould with a rotational movement wherein the axis of rotation is situated inside the periphery of the object and is adjoined closely to the surface of the object, so that the malleable material is urged towards the outer edge of the object.

6,039,908

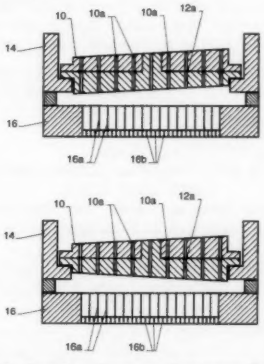
METHOD FOR HONEYCOMB EXTRUSION USING A CORRECTED FLOW GRADIENT

Thomas W. Brew, and Harry A. Kragle, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Provisional application No. 60/032,094, Dec. 4, 1996. This application Nov. 24, 1997, Appl. No. 977,452.

Int. Cl.[7] **B29C** *47/08*

U.S. Cl. 264—177.12 **3 Claims**



1. A method for forming a honeycomb structure from an extrudable material which comprises:

directing a feed stream of the material along an extrusion path through a first plurality of apertures in a first aperture plate disposed across the feed stream, the first apertures having varying flow resistance across the first aperture plate to impart a first flow velocity or pressure drop gradient across the width of the feed stream;

thereafter directing the feed stream through a second plurality of apertures in a second aperture plate, the second apertures having varying flow resistance across the second aperture

plate to superimpose a second pressure drop or flow velocity gradient on the first pressure drop or flow velocity gradient across the width of the flow stream; and

thereafter directing the feed stream with superimposed first and second pressure drop or flow velocity gradients through a honeycomb extrusion die.

6,039,909

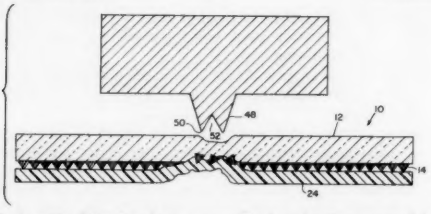
METHOD FOR FORMING A RETROREFLECTIVE SHEETING HAVING A PLURALITY OF CELLS WITH MULTI-COURSE, HATCHED PATTERNED PERIMETERS

Gus Bernard, West Hartford, and Jay Soaft, New Britain, both of Conn., assignors to Reflexite Corporation, Avon, Conn.

Continuation of application No. 08/443,836, May 18, 1995. This application Nov. 21, 1997, Appl. No. 976,095.

Int. Cl.[7] B29C *33/40*

U.S. Cl. 264—220 **18 Claims**



1. A method for forming a retroreflective sheeting, comprising the steps of:

a) providing a first light transparent thermoplastic polymer layer having a thickness in the range of about 0.003 to 0.022 inches;

b) forming light transparent prism elements in a prism array on the first thermoplastic polymer layer, said prism elements being formed of a polymer material which is transparent and substantially inflexible at room temperature;

c) applying a second thermoplastic layer to the prism array on a side of the array opposite the first layer; and

d) welding the first thermoplastic layer to said second thermoplastic layer, while applying a die having a plurality of cells with multi-course, hatched patterned perimeters to said layers to dislocate a portion of the prism elements of the prism array, whereby the first thermoplastic layer bonds to the second thermoplastic layer at said portion, thereby forming the retroreflective sheeting.

6,039,910

GOLF BALL AND MANUFACTURING METHOD OF GOLF BALL CORE

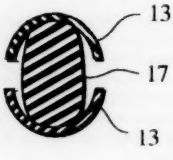
Hiroaki Tanaka; Yoshiyuki Okido, and Hideki Sano, all of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jul. 30, 1998, Appl. No. 126,418

Claims priority, application Japan, Aug. 28, 1997, 9-249448

Int. Cl.[7] B29C *65/00*

U.S. Cl. 264—248 **7 Claims**



1. A manufacturing method of a golf ball core, comprising the steps of:

semi-vulcanizing an unvulcanized material to form outer layer half shells whose shapes are generally hemispherical shells;

putting an unvulcanized material for forming an inner layer between said pair of outer half shells to be vulcanizing pressed to form the golf ball core consisting of the outer and the inner layer.

6,039,911

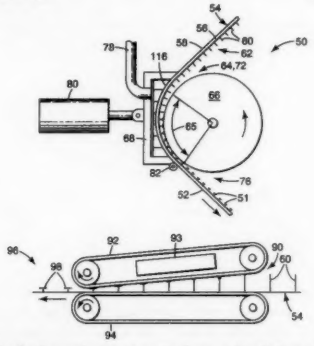
METHOD FOR CAPPING STEM FASTENERS

Philip Miller, and Thomas R. LaLiberte, both of Eagan, Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Jan. 9, 1997, Appl. No. 781,783

Int. Cl.[7] B29C *43/22*

U.S. Cl. 264—280 **28 Claims**



1. A method of capping a stem to form a headed stem fastener comprising the steps of:

providing a precursor web comprising a backing with a rear surface, a front surface, and a multiplicity of polymeric stems projecting distally from the front surface of the backing;

positioning a heated member opposite a support surface to form a variable nip having a variable nip length, the support surface having a shape generally conforming to a contour of the heated member; and

feeding the precursor web through the variable nip to compressively engage the polymeric stems between the heated member and the support surface along a portion of the variable nip length so that distal ends of the polymeric stems are compressed axially downward into a hook head shape having an axial diameter to thickness ratio of from 1.5:1 to 12:1.

6,039,912

FABRICATION METHOD FOR HOUSING STRUCTURE FOR PROJECTION TYPE TELEVISION RECEIVERS

Tadashi Ohira, Kobe; Yoshiaki Sato, Takatsuki, and Kazuhiko Kodama, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of application No. 08/898,534, Jul. 22, 1997. This application Sep. 8, 1998, Appl. No. 149,580.

Claims priority, application Japan, Jul. 22, 1996, 8-191891

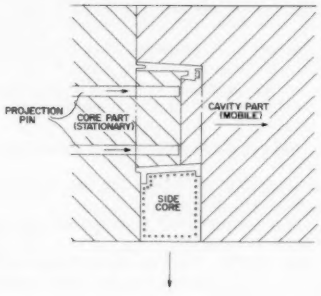
Int. Cl.[7] B29C *45/37*

U.S. Cl. 264—328.1 **5 Claims**

1. A method of fabricating a housing structure for a projection television receiver comprising the steps of:

i) forming a casing with a first opening formed on a front side thereof and a second opening formed on the back side thereof by:

a) providing a resin molding die for forming said casing, said resin molding die having a core part, a side core part, and a cavity part, in which said first opening is located on the core part of said molding die, said second opening is located on the cavity part of said molding die and a bottom



side of said casing is located on the side core part of said molding die, said bottom side including a third opening sufficiently sized to accommodate an image projected therethrough; and

b) introducing resin into said die and allowing said resin to cool; and

ii) installing a square-shaped framework on the front side of said casing, said square-shaped framework provided with a fourth opening, said casing and said square-shaped framework adapted for retaining a screen therebetween, said screen being detachable from said casing through said first opening, said screen covering said fourth opening.

6,039,913

PROCESS FOR THE MANUFACTURE OF AN OPHTHALMIC MOLDING

Thomas Hirt, Atlanta; Richard Carlton Baron, Alpharetta, both of Ga.; Dieter Lohmann, Münchenstein, and Wolfgang Peter Meier, Basel, both of Switzerland, assignors to Novartis AG, Basle, Switzerland

Filed Aug. 27, 1998, Appl. No. 141,252

Int. Cl.[7] **C08J** *5/00*

U.S. Cl. 264—331.11 **24 Claims**

1. A process for the manufacture of a molding, which comprises the following steps:

a) providing at least one prepolymer comprising one or more crosslinkable groups, wherein the prepolymer is an amphiphilic segmented copolymer comprising at least one hydrophobic segment and one hydrophilic segment;

b) preparing an at least partly bicontinuous mesophase of the prepolymer by combining the prepolymer with an aqueous solution at a ratio that will give a microstructure which is at least partly bicontinuous and causing or allowing the bicontinuous microstructure to form;

c) introducing the mesophase obtained into an ophthalmic mold;

d) crosslinking the prepolymer to form the molding; and

e) opening the mold such that the molding can be removed.

6,039,914

METHOD OF CONVERTING ASPHALT COMPOSITION ROOFING SHINGLES INTO DIMENSIONAL CONSTRUCTION PRODUCTS

Larry M Gehrke, Springfield; Russel J. Gehrke, Ozark; Michael S. Gehrke, and Gabriel P. Gehrke, both of Seymour, all of Mo., assignors to Future Tek, Inc., Springfield, Mo.

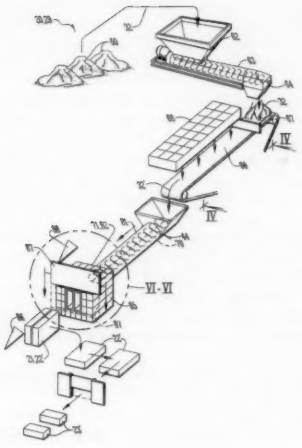
Provisional application No. 60/043,022, Apr. 15, 1997. This application Apr. 14, 1998, Appl. No. 60,040.

Int. Cl.[7] **B02C** *19/12*

U.S. Cl. 264—460 **14 Claims**

1. A process of converting asphalt composition roofing shingles into dimensional construction products comprising the steps of:

providing an infeed of asphalt composition roofing shingles having an asphalt component;



de-consolidating the infeed of asphalt composition roofing shingles into a crumble;

warming the crumble to a bulk or mean temperature of between about 130° F. and 150° F.;

compacting and shaping the warmed crumble to obtain a given dimensional construction product; and

allowing cooling of the dimensional construction product, whereby portions of the asphalt component reconsolidate.

6,039,915

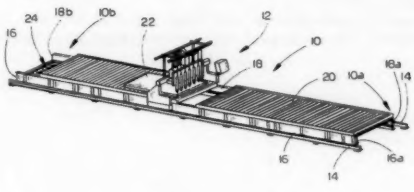
BURN TABLE

Larry L. Minter, Jefferson, S. Dak., and Greg L. Parham, Sioux City, Iowa, assignors to Missouri Valley Steel Company, Sioux City, Iowa

Filed Apr. 23, 1998, Appl. No. 64,968

Int. Cl.[7] **B23K** *7/08*

U.S. Cl. 266—49 **26 Claims**



1. Apparatus for removing slag from beneath a flame cutting table, the table having a pair of parallel, spaced apart vertical panels extending horizontally from a forward end to a rearward end, with a plurality of spaced apart slats mounted transversely along upper edges of the panels, comprising:

a generally vertically oriented blade having upper and lower edges, opposing vertical side edges, a forward pushing surface, and a rearward surface, said blade positioned beneath the table slats and between the panels;

drive means connected to the blade for driving the blade between the rearward and forward ends of the table;

a first elongated push arm connected at a forward end to the rearward surface of the blade, and said drive means being connected to a rearward end of the push arm;

said drive means being mounted on a support frame, and the rearward end of the push arm being pivotally connected to the support frame for pivotal movement about a pivot axis parallel to the blade and orthogonal to the panels;

a second push arm connected at a forward end to the blade and pivotally connected at a rearward end to the support frame, said second push arm parallel and spaced apart from the first push arm and having a pivot axis coaxial with the first push arm pivot axis;

said first and second push arms being rigidly affixed to the blade such that the blade will pivot only about the pivot axes of the push arms;

a removable wear plate attached along the lower edge of the blade and forming a scraping edge, the wear plate and a lower portion of the blade extending forwardly and downwardly relative to vertical;

said support frame including an elongated base member extending orthogonally between the panels with said push arms pivotally connected thereto;

means on the base member for maintaining the orthogonal orientation of the base member relative to the panels as the drive means drives the blade a length of the table from end to end;

said means for maintaining the orthogonal orientation of the base member including:

a first leg mounted on a first end of the base member and projecting forwardly therefrom orthogonal to the base member;

a second leg mounted on a second end of the base member and projecting forwardly therefrom parallel to the first leg;

a first guide rail mounted on one of said panels and extending the length of the panel;

a second guide rail mounted on the other of said panels and extending the length of the panel;

first follower means on the first leg for following the first guide rail; and

second follower means on the second leg for following the second guide rail.

6,039,916

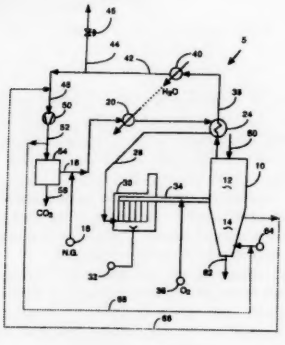
APPARATUS FOR PRODUCING DIRECT REDUCED IRON WITH A CONTROLLED AMOUNT OF CARBON

Juan Celada-Gonzalez; Raul Gerardo Quintero-Flores; Ricardo Viramontes-Brown, all of San Pedro Garza Garcia, and Roberto Octaviano Flores-Serrano, Monterrey, all of Mexico, assignors to Hylsa S.A. de C.V., San Nicolas de los Garza, Mexico

Division of application No. 08/719,930, Sep. 25, 1996, Pat. No. 5,858,057. This application Oct. 19, 1998, Appl. No. 175,396.

Int. Cl.[7] C21B *13/02*

U.S. Cl. 266—82 **6 Claims**



1. An apparatus for reducing particulate iron-oxide-containing particles to produce DRI with a controlled amount of carburization without an external reformer, which comprises:

a vertical shaft moving bed reduction reactor having a reducing zone,

a reducing gas loop for circulating at least a major portion of the top effluent gas from the reducing zone of said reactor for conditioning and upgrading and return as improved recycle reducing gas to the reducing zone of said reactor,

said loop including:

a cooling and scrubbing unit for cooling and cleaning said top effluent gas,

pump for circulating recycle reducing gas through said loop and said reactor,

a carbon dioxide removal unit for removal of carbon dioxide from the recycle reducing gas,

a gas heater capable of raising the temperature of the gas stream circulating through said loop to the range between 850° C. and 1000° C.,

means for adjusting the water content of the recycle reducing gas,

means for mixing natural gas with said recycle reducing gas, and

means for mixing and controlling an amount of an oxygen-containing gas with said recycle reducing gas before said gas enters said reactor.

6,039,917

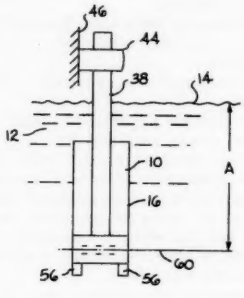
JET COLUMN REACTOR PUMP WITH COAXIAL AND/OR LATERAL INTAKE OPENING

Jorge A. Morando, 526 Riverview Trail, Cadiz, Ky. 42211

Continuation-in-part of application No. 08/733,078, Oct. 16, 1996, Pat. No. 5,863,314, which is a continuation-in-part of application No. 08/489,322, Jun. 12, 1995, Pat. No. 5,683,650, Provisional application No. 60/041,146, Mar. 17, 1997. This application Jan. 12, 1998, Appl. No. 5,497.

Int. Cl.[7] C21D *1/62*

U.S. Cl. 266—217 **33 Claims**



1. In a metal treating apparatus having a pot for holding a bath of molten metal, transfer means for moving the molten metal in the pot, including a molten metal-lifting passage having inlet opening means disposed in the molten metal for receiving molten metal into the metal-lifting passage, the metal-lifting passage having an outlet opening in the molten metal for discharging molten metal received in the inlet opening means, the metal-lifting passage having gas-injection openings upstream of the molten metal outlet opening; gas passage means for connecting a source of gas to the gas-injection openings in the form of a gas jet into the metal-lifting passage such that the gas induces a flow of molten metal from the molten metal inlet opening means toward the molten metal outlet opening along an axis of motion, the improvement comprising:

the molten metal inlet opening means comprising a window in the metal-lifting passage disposed coaxially and/or laterally with respect to the path of motion of the gas flowing through the metal-lifting passage;

the gas-injection openings are disposed to introduce a gas jet into the metal-lifting passage along said axis of motion; and

the gas injection openings discharge the gas into the metal lifting passage in the direction of metal flow as the gas mixes with the metal.

6,039,918

ACTIVE BRAZING SOLDER FOR BRAZING ALUMINA-CERAMIC PARTS

Frank Hegner, Lörrach; Elke Maria Schmidt, Schopfheim; Volker Güther, Burgthann; Andreas Otto, Fürth; Jürgen Breme, Berschweiler Strasse 32, D-66265 Heusweiler; Heinz Müller, Merchweiler, and Jürgen Peter Turnsek, Völklingen, all of Germany, assignors to Endress + Hauser GmbH + Co., Maulburg; GFE Metalle und Materialien GmbH, Nuremburg, and Jurgen Breme, Heuseweiler, all of Germany

Provisional application No. 60/023,079, Aug. 2, 1996. This application Jul. 18, 1997, Appl. No. 896,481.

Claims priority, application European Pat. Off., Jul. 25, 1996, 96111987

Int. Cl.[7] C22C *16/00*

U.S. Cl. 420—422 **3 Claims**

	T_L / °C	R_M / MPa
(ZrFe16.5Ti9)99Be1	960	38
(ZrFe16.5Ti9)98Be2	920	116
ZrTi10Be4	940	35

1. An active brazing solder for brazing alumina-ceramic parts, which contains about 8.6 wt. % titanium, about 4 wt. % beryllium, about 15.8 wt. % iron and about 71.6 wt. % zirconium, the remainder being any impurities that may be present.

6,039,919

HIGH CORROSION RESISTING ALLOY FOR DIESEL ENGINE VALVE

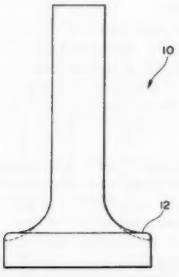
Tomotaka Nagashima, Tokai; Michio Okabe, Chita; Toshiharu Noda, Tajimi, and Kiyoshi Okawachi, Tokyo, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, and Nittan Valve Co., Ltd., Tokyo, both of Japan

Filed Feb. 3, 1998, Appl. No. 17,877

Claims priority, application Japan, Feb. 7, 1997, 9-039937

Int. Cl.[7] C22C *19/05*

U.S. Cl. 420—446 **8 Claims**



1. A high corrosion resisting alloy for a diesel engine valve consisting essentially by weight percentage of not more than 0.1% of C, not more than 1.0% of Si, an effective amount of Mn to prevent embrittlement caused by S to not more than 1.0% more than 25% and not more than 32% of Cr, more than 2.0% and not more than 3.0% of Ti, 1.0 to 2.0% of Al, and the balance being Ni plus incidental impurities.

6,039,920

PROCESS FOR MAKING RHENIUM-CONTAINING ALLOYS

Michael Koch, Bruchköbel; Wulf Kock, Alzenau; David Francis Lupton, Gelnhausen, and Friedhold Scholz, Rodenbach, all of Germany, assignors to W. C. Heraeus GmbH & Co. KG, Hanau, Germany

Filed May 4, 1998, Appl. No. 72,381

Claims priority, application Germany, May 12, 1997, 197 19 407; Mar. 18, 1998, 198 11 765

Int. Cl.[7] C22C *1/03*

U.S. Cl. 420—590 **15 Claims**

1. A process for making an alloy containing rhenium comprising

(a) melting together the components that form the alloy, at least one of the components being a rhenium master alloy produced by melting, the rhenium master alloy comprising rhenium in an amount of 30 to 70 wt % and 30 to 70 wt % of at least one metal selected from the group consisting of iron, cobalt and nickel;

(b) casting the resultant melt from step (a); and

(c) allowing the melt to solidify.

6,039,921

LIQUID PHASE DISINFECTION/STERILIZATION WITH MICROWAVE ENERGY

Raymond M. G. Boucher, 5602 N. Scottsdale Rd., Scottsdale, Ariz. 85253

Filed Nov. 25, 1997, Appl. No. 978,396

Int. Cl.[7] A61L *2/12;2/16*

U.S. Cl. 422—21 **33 Claims**

1. A method for disinfecting or sterilizing a surface of a dental, medical or laboratory instrument which comprises exposing the instrument to a biocidal solution consisting essentially of hydrogen peroxide and a weak organic acid selected from acetic acid, citric acid, lactic acid and white distilled vinegar or a mixture thereof while simultaneously subjecting the instrument to microwave irradiation, the temperature of the biocidal solution being less than or equal to 65° C.

6,039,922

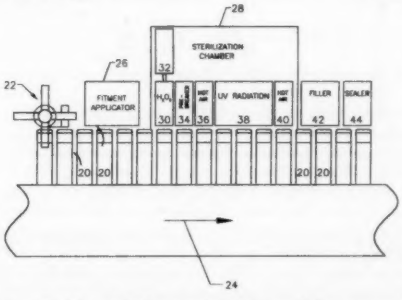
UV RADIATION AND VAPOR-PHASE HYDROGEN PEROXIDE STERILIZATION PACKAGING

Ronald Swank, Crystal Lake, and Sevugan Palaniappan, Grayslake, both of Ill., assignors to Tetra Laval Holdings & Finance, SA, Pully, Switzerland

Filed Aug. 15, 1997, Appl. No. 911,967

Int. Cl.[7] A61L *2/10;2/20;* **B65B** *55/18;55/10*

U.S. Cl. 422—24 **14 Claims**



1. A method for sterilizing a series of cartons being processed on a multiple station form, fill and seal packaging machine, each of the cartons erected and having sidewalls defining a hollow interior, the method comprising:

forming the bottom of each of the erected cartons on a mandrel to create a series of partially formed cartons;

placing each of the partially formed cartons on a conveyor assembly;

moving each of the partially formed cartons along the conveyor assembly at a predetermined interval to a vapor nozzle disposed above a partially formed carton on the conveyor assembly;

transforming a 35% concentration of hydrogen peroxide into a vapor phase hydrogen peroxide at a vaporizer, the vaporizer disposed above and in flow communication with the vapor nozzle;

applying a predetermined quantity of vapor-phase hydrogen peroxide for the predetermined interval to the interior and the exposed exterior of each of the partially formed cartons positioned at the vapor nozzle, the vapor-phase hydrogen peroxide applied through the vapor nozzle disposed approximately above the center of each of the partially formed cartons;

condensing the vapor-phase hydrogen peroxide onto each of the partially-formed cartons;

flowing hot air into each of the partially-formed cartons for the predetermined interval to remove hydrogen peroxide at a first hot air distribution station;

irradiating each of the partially formed cartons with ultraviolet radiation from a ultraviolet radiation source for a multiple of the predetermined interval, the ultraviolet radiation source disposed above the conveyor assembly and having a reflector to widely disperse the ultraviolet radiation to provide irradiation of the interior and the exposed exterior of each of the partially formed cartons; and

flowing hot air into each of the partially formed cartons for the predetermined interval at a second hot air distribution station to remove substantially all of the hydrogen peroxide;

whereby each of the partially formed cartons are sterilized and have a residue less than 0.5 parts per million of hydrogen peroxide while having a 4.5 log reduction of microogranisms.

6,039,923

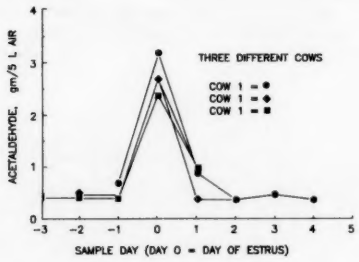
METHOD AND KIT FOR MONITORING MAMMALIAN REPRODUCTIVE CYCLES

William Robert Klemm, Bryan, Tex., and Germain Francois Rivard, Philadelphia, Pa., assignors to Texas A & M University System, College Station, Tex.

Division of application No. 08/293,666, Aug. 22, 1994, Pat. No. 5,721,142. This application Mar. 22, 1996, Appl. No. 621,068.

Int. Cl.[7] G01N *1/22;33/50*

U.S. Cl. 422—61 **8 Claims**



1. A kit for predicting the occurrence of ovulation in a mammal comprising:

sample collection means for non-invasively collecting a body constituent sample containing acetaldehyde;

a detector for measuring the quantity of the acetaldehyde in the sample; and

means for monitoring variations in the amount of the acetaldehyde in the sample over said mammal's reproductive cycle and comparing those variations with variations that are known to occur over that cycle.

6,039,924

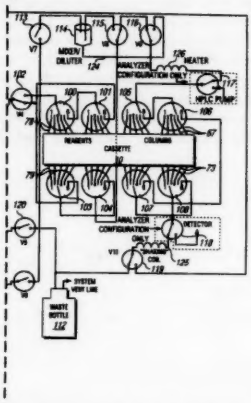
CHEMICAL SAMPLE TREATMENT SYSTEM AND CASSETTE, AND METHODS FOR EFFECTING MULTISTEP TREATMENT PROCESS

Marcus J. Horn, Redwood Shores, Calif., assignor to Amersham Pharmacia Biotech AB, Uppsala, Sweden

Continuation of application No. 08/802,511, Feb. 20, 1997, Pat. No. 5,918,273, which is a division of application No. 08/679,355, Jul. 9, 1996, Pat. No. 5,800,784. This application Sep. 3, 1998, Appl. No. 146,160.

Int. Cl.[7] G01N *35/10*

U.S. Cl. 422—67 **10 Claims**



10. A chemical treatment system for treatment of less than milligram quantities of a chemical sample, comprising in operative combination:

a) a chemical sample retainer for holding a plurality of chemical samples for chemical treatment, said chemical sample retainer further comprising:

i) a sample funnel for receiving a plurality of chemical sample solutions, said sample funnel permitting individual addressing of each of said plurality of chemical sampling solutions for chemical treatment;

ii) a retainer for an individual preselected chemical sample, said retainer being in flow-through, physical connection with said funnel, and providing near-zero dead volume compression fit;

iii) at least one reagent retainer for preselected reagents, said reagent retainer permitting flow-through communication therethrough;

iv) a machine readable code disposed on said chemical sample retainer for identifying the chemistry protocols to be performed on the retained samples in said individual sample retainer;

b) a sample loading mechanism for loading sample solutions in said sample funnel, and including an X-Y positioner for aligning said chemical sample retainer to a predetermined X-Y position, a sealing gasket, and a pressure cap for introduction of pressurized gas into said sample funnel and for forcing a sample solution through said individual sample retainer;

c) a chemical treatment station for performing predetermined chemistries on a plurality of preselected retained chemical samples located in said chemical sample retainer, said chemical treatment station further including;

i) a code reader for reading said machine readable code disposed on said chemical treatment cassette to identify the specific chemistry protocols to be performed on said retained chemical samples;

ii) a scanner to identify populated mini-column addresses;

iii) a micro-controller interface for communicating from said code reader to a micro-controller said identified specific chemistry protocols, said micro-controller accessing specific process algorithms pursuant to the specific identified chemistry protocols, said process algorithms defining and

communicating to said micro-controller interface step-wise micro-controller control instructions to enable execution of said identified specific chemistries on said pre-selected chemical samples at said populated mini-column addresses;

iv) a chemical cassette/treatment interface for enabling flow-through localized communication of said chemical sample retainer with said chemical treatment station, said interface including a docking mechanism for precision alignment of said chemical sample retainer, and a flow-through localized interface between said chemical treatment station and slid chemical sample retainer;

v) a chemical delivery subsystem for providing automatic flow through chemistries on said preselected chemical samples, the chemical delivery subsystem including solvent storage for a plurality of reagents and solvents to said reagent retainer for solubilizing said reagents retained therein and to said chemical sample retainer for treatment of said chemical samples in said individual sample retainer pursuant to said identified specific chemistry protocols, a valve for individual addressing of said individual sample retainer and for individual addressing of said reagent retainer, a plurality of accumulators for temporary storage of solvents and reagents, and temporary storage of detached chemical sample to enable chemistries to be performed on said detached samples, and to enable chemistries not including said detached samples as a reactant to be performed in said individual sample retainer, a mixer/diluter reservoir in communication with said solvent bank, reagent wells, and mini-columns for temporary retention of at least one of a solvent, reagent, sample, and mixtures thereof, a pneumatic pressurizing system for bi-directional transfer of solvents, reagents, and chemical samples to and from said reagent wells, said mini-columns, said accumulators, and said mixer/diluter, and for supplying inert gas to said chemical treatment delivery subsystem, and a valve integrating of an analyzer subsystem into said chemical delivery subsystem to permit automatic analysis of the sample retained in said mini-columns without removal of said mini-columns from said chemical treatment cassette and without disengaging said cassette/treatment station interface.

6,039,925

FLUORESCENCE DETECTOR

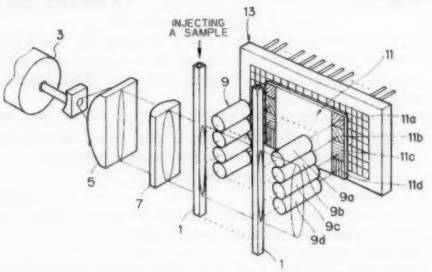
Ryoji Nemoto, Honjo, Japan, assignor to Hitachi Electronics Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1998, Appl. No. 123,481

Claims priority, application Japan, Aug. 7, 1997, 9-225696

Int. Cl.[7] G01N *21/64*

U.S. Cl. 422—82.08 **6 Claims**



1. A fluorescence detector comprising a tubular electrophoretic means through which a sample labelled with four kinds of fluorescent dye is caused to migrate, illumination optics for illuminating the tubular electrophoretic means with exciting light and detection optics for detecting the fluorescence emitted from the sample illuminated with the exciting light, wherein a plurality of tubular electrophoretic means are arranged in a row, a plurality of graded-index lens arrays are arranged parallel to and in the same number as said plurality of tubular electrophoretic means, each lens array being composed of four vertically stacked graded-index lenses, a plurality of bandpass filter arrays are also arranged parallel to and in the same number as said plurality of electrophoretic means, each filter array being composed of four filters arranged vertically in a row, and a planar light-receiving means is provided at the back of the rows of said bandpass filters.

6,039,926

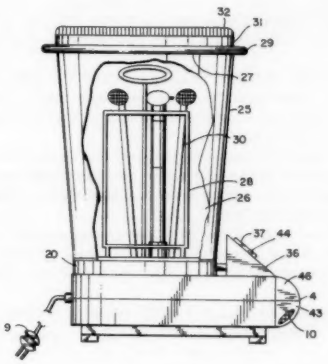
FORCED HOT AIR STERILIZING METHOD AND APPARATUS

Richard B. Goldman, New York, N.Y., assignor to Laurence M. Steel, New York, N.Y., a part interest

Continuation-in-part of application No. 08/663,598, Jun. 14, 1996, abandoned, which is a continuation of application No. 08/391,630, Feb. 21, 1995, abandoned, which is a continuation of application No. 08/151,545, Nov. 12, 1993, abandoned. This application Apr. 16, 1997, Appl. No. 839,240.

Int. Cl.[7] G05B *17/00*

U.S. Cl. 422—116 **16 Claims**



1. A table-top apparatus for sterilizing medical or dental instruments or other small professional or domestic instruments that may require occasional or periodic sterilization, comprising:

a. a housing defining a chamber therein and constructed and arranged to receive air heated to at least a predetermined sterilizing temperature, said housing having a greater height than width so as to occupy a minimal amount of space on said table-top;

b. support means for supporting instruments to be sterilized within said chamber;

c. an air inlet to permit air from outside the housing to be drawn into said chamber;

d. heater means for heating said air to the sterilizing temperature;

e. blower means for forcing heated air and outside air into said chamber at different times, whereby heated air and outside air sequentially are forced into contact with said instruments, said heated air sterilizing said instruments located in said chamber;

f. means for exhausting said heated air and said outside air sequentially from said chamber and from said housing; and

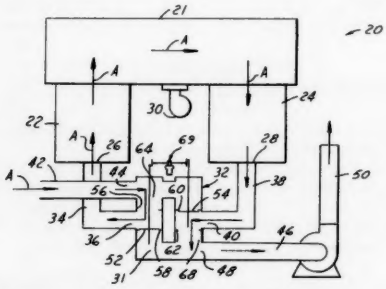
g. timer means connected to said heater means and said blower means for receiving data input by a user defining a characteristic heating interval and a characteristic cooling interval, for switching the heater means from an on state to an off state after the heater means has been in the on state for a period of time substantially equal to the characteristic heating interval, and for switching the blower means from an on state to an off state after the blower means has been in the on state for a period of time substantially equal to the characteristic heating interval plus the characteristic cooling interval.

6,039,927

VALVE SYSTEM FOR REGENERATIVE THERMAL OXIDIZERS

Richard Greco, 89 Onyx Pl., Matawan, N.J. 07747

Filed Nov. 4, 1997, Appl. No. 964,440
Int. Cl.[7] F01N *3/10;* **F16K** *11/00*
U.S. Cl. 422—175 **19 Claims**



1. A regenerative thermal oxidizer, comprising:

a first heat exchanger defining a first flow path;

a first inlet/outlet in association with said first heat exchanger, said first inlet/outlet providing flow access to said first flow path;

a second heat exchanger defining a second flow path;

a second inlet/outlet in association with said second heat exchanger, said second inlet/outlet providing flow access to said second flow path;

a valve assembly having at least two poppet discs, said valve assembly defining multiple flow passages therethrough;

said valve assembly being in flow communication with said first and second inlet/outlets;

each of said poppet discs being mounted on a separate rod;

an eccentric mechanical drive, said eccentric mechanical drive having a drive shaft and a drive disc at each end of said drive shaft;

linkage attached to said drive shaft at said drive discs; and

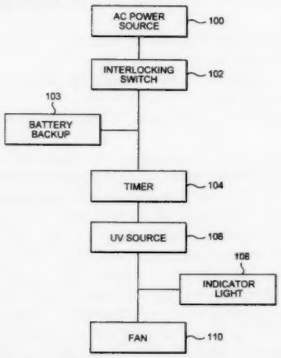
said rods being attached to said linkage.

6,039,928

WRITING IMPLEMENT STERILIZATION APPARATUS

Jon L. Roberts, 529 Clear Spring Rd., Great Falls, Va. 22066

Filed Jan. 28, 1998, Appl. No. 14,559
Int. Cl.[7] B01J *19/00*
U.S. Cl. 422—186.3 **26 Claims**



16. A writing implement sterilization apparatus comprising:

a container;

a lid attached to the container;

a first source of ultraviolet radiation, disposed within the container;

a second source of ultraviolet radiation, disposed within the lid;

a writing implement holder for supporting writing implements disposed within the container;

a power supply connected to the first source; and

an interlocking switch, connected between the power supply and the first source and being biased to the off position, such that when the lid is in an open position the interlocking switch is not engaged and no power is supplied to the first source and when the lid is closed, the interlocking switch is engaged and power is supplied to the first source.

6,039,929

SYNTHESIS OF MONOCLINIC CELSIAN

Ilzoo Lee, Stevenson Ranch, Calif., and Josephine Covino, Vienna, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1997, Appl. No. 990,261
Int. Cl.[7] C01B *33/24;33/26*
U.S. Cl. 423—328.2 **1 Claim**

STEP 1	PREFERRED EMBODIMENT
FORMING A MIXTURE OF SILICA ALKOXIDE, ALUMINUM ALKOXIDE, AND BARIUM SALT	TETRAETHOXY SILANE(TEOS), Et(OH), WATER(1:10:4) ADD DROPS OF HF (1N) WITH STIRRING REFLUX FOR TWO HOURS AT 60°C COOL TO ROOM TEMPERATURE ADD ALUMINUM SEC–BUTOXIDE:ISO–PROPANOL (1:10) MIX FOR 24 HOURS IN CLOSED CONTAINER ADD BARIUM ACETATE DISSOLVED IN WATER

STEP 2	PREFERRED EMBODIMENT
FLUORINE CATALYST ADDED	ADD HYDROFLUORIC ACID AND ADJUST TO pH OF 3 TO 4 MIX FOR ONE HOUR DRY AT 65°C FOR THREE WEEKS

STEP 3	PREFERRED EMBODIMENT
CALCINE MIXTURE	CRUSH AND GRIND DRIED GEL CALCINE AT 800°C AT 3°C/MINUTE FOR THREE HOURS COOL TO ROOM TEMPERATURE GRIND TO UNIFORM FINE PARTICLE SIZE

STEP 4	PREFERRED EMBODIMENT
HEAT TREAT MIXTURE	HEAT TREAT AT 1200°C FOR TEN HOURS

1. A process for producing monoclinic strontium aluminosilicate comprising the steps of:

(a) forming a mixture of an alkoxide of silica, an alkoxide of aluminum, and an oxide of strontium;

(b) adding a catalyst of a fluorine containing compound to the mixture;

(c) calcining the catalyzed mixture; and,

(d) heat treating the calcined mixture effective to form monoclinic strontium aluminosilicate.

6,039,930

PROCESS FOR PRODUCING METAL COMPOUNDS FROM GRAPHITE OXIDE

Ching-Cheh Hung, Westlake, Ohio, assignor to The United States of America as represented by Administration of the National Aeronautics and Space Administration, Washington, D.C.

Division of application No. 08/833,107, Apr. 4, 1997, Pat. No. 5,876,687. This application Oct. 14, 1998, Appl. No. 172,520.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] C01B *13/14;* **C01F** *7/00*
U.S. Cl. 423—592 **7 Claims**

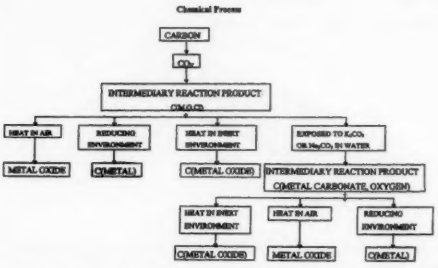
1. A process for producing material comprising metal compounds from graphite oxide comprising the steps of:

providing graphite oxide;

exposing the graphite oxide to a metal chloride at or below the thermal decomposition temperature of the graphite oxide for sufficient time to form an intermediary carbonaceous reaction product comprising elements of metal, oxygen, and chlorine; and

removing the chlorine from the intermediary carbonaceous reaction product by

placing the intermediary reaction product in an aqueous solution including at least one member of the group consisting of



potassium carbonate and sodium carbonate for a time sufficient to remove the chlorine and produce a carbonaceous reaction product comprising metal carbonate and oxygen.

6,039,931

DERIVATIZED DTPA COMPLEXES, PHARMACEUTICAL AGENTS CONTAINING THESE COMPOUNDS, THEIR USE, AND PROCESSES FOR THEIR PRODUCTION

Heribert Schmitt-Willich; Johannes Platzek; Heinz Gries; Gabrielle Schumann-Giampieri; Hanns-Joachim Weinmann; Hubert Vogler; Julius Deutsch, and Juergen Conrad, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Division of application No. 07/909,379, Jul. 6, 1992, abandoned, which is a continuation of application No. 07/809,830, Dec. 20, 1991, abandoned, which is a continuation of application No. 07/780,840, Oct. 23, 1991, abandoned, which is a continuation-in-part of application No. 07/544,530, Jun. 28, 1990, abandoned. This application Oct. 6, 1994, Appl. No. 319,357.

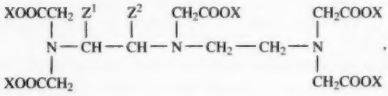
Claims priority, application Germany, Jun. 30, 1989, 39 22 005

Int. Cl.[7] **A61K** *49/00;* **C07F** *5/00*

U.S. Cl. 424—9.364 **35 Claims**

1. A method of enhancing an NMR image comprising administering to a patient a compound of the formula

(I)



wherein

one of Z^1 and Z^2 is H and the other is

$$—(CH_2)_m—(C_6H_4)_q—(O)_k—(CH_2)_n—(C_6H_4)_l—(O)_r—R,$$

wherein

m and n, independently, are each 0–20,

k, l, q and r are each, independently, 0 or 1,

R is H, C_1–C_6-alkyl, OR^1-substituted C_1–C_6-alkyl or CH_2COOR^1,

R^1 is H, C_1–C_6-alkyl or benzyl; and

X is, in each case, a hydrogen atom or a metal ion equivalent of an element of atomic number 21–29, 42, 44 or 58–70;

with the provisos that:

at least two X groups represent a metal ion equivalent of atomic number 21–29, 42, 44 or 58–70;

when n and l are each 0, then k and r are not each simultaneously 1;

$—(O)_r—R$ is not —OH;

Z^1 and Z^2 are not $—C_6H_5$, $—CH_2—C_6H_5$, $—CH_2—C_6H_4—O—CH_2—COOCH_2C_6H_5$ or $—CH_2—C_6H_4—O—(CH_2)_5—COOCH_2C_6H_5$; and

at least one of q and l is 1;

or a physiologically acceptable salt thereof with an inorganic and/or organic base, an amino acid or an amino acid amide.

6,039,932

MEDICINAL INHALATION AEROSOL FORMULATIONS CONTAINING BUDESONIDE

Nayna Govind, West Bridgford; Philip A. Jinks, Mountsorrel, both of United Kingdom; Danna L. Ross, Pine Springs, Minn., and Gary H. Ward, San Diego, Calif., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Provisional application No. 60/032,092, Dec. 3, 1996. This application Sep. 25, 1997, Appl. No. 937,520.

Claims priority, application United Kingdom, Sep. 27, 1996, 9620187

Int. Cl.[7] **A61K** *9/12*

U.S. Cl. 424—45 **15 Claims**

1. A pharmaceutical aerosol formulation suitable for administration to a patient by oral or nasal inhalation consisting of a suspension of particulate budesonide, a hydrofluoroalkane propellant and optionally one or more of:

(i) one or more additional hydrofluoroalkane propellants

(ii) surfactant selected from oleic acid, sorbitan oleates and lecithin, and

(iii) adjuvant having a Kauri-butanol value of at least 10.

6,039,933

COSMETIC COMPOSITION PRESSURIZED IN AN AEROSOL DEVICE AND THE RESULTING FOAM

Henri Samain, Bièvres, and Isabelle Cretois, Clichy, both of France, assignors to L'Oreal, Paris, France

PCT No. PCT/FR97/01163, § 371 Date Jun. 9, 1998, § 102(e) Date Jun. 9, 1998, PCT Pub. No. WO98/03148, PCT Pub. Date Jan. 29, 1998

PCT Filed Jun. 30, 1997, Appl. No. 43,220

Claims priority, application France, Jul. 17, 1996, 96 08958

Int. Cl.[7] **A61K** *7/06;7/11;9/12*

U.S. Cl. 424—47 **48 Claims**

1. A cosmetic composition pressurized in an aerosol device in the presence of at least one foam-forming propellant, comprising, in a cosmetically acceptable medium, at least one fixing polymer, at least one oxyalkylenated silicone and at least 30% by weight, relative to the total weight of said composition, said propellant not included, of at least one water-soluble solvent with a boiling point of less than 85° C.

6,039,934

USE OF XANTHAN GUM FOR GELLING ClO_2 AND RELATED SPECIES

Howard Alliger, 10 Ponderosa Ave., Melville, N.Y. 11747

Filed Aug. 4, 1998, Appl. No. 128,898

Int. Cl.[7] **A61K** *7/20;33/20*

U.S. Cl. 424—53 **20 Claims**

1. A storage stable chlorine dioxide generating composition in two parts to be mixed together to generate chlorine dioxide comprising a chlorite-containing part (A) and an acid-containing part (B), said chlorite-containing part (A) consisting essentially of an aqueous solution of about 0.1% to about 5% by weight of a water-soluble chlorite salt and an amount of xanthan gum as a gelling agent effective to gel said solution, said solution having a pH ranging from about 11.0 to about 13.0. said acid-containing part (B) comprising an amount of a protic acid in solution effective to produce an initial pH upon combining and mixing said parts A and B of less than about 5.5 and an amount of an acid stable gelling agent effective to gel said part B, said parts A and B being storage stable for a period of at least about 6 months.

6,039,935

SUNSCREEN COMPOSITIONS

Fatemeh Mohammadi, Hebron, Conn., assignor to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.

Provisional application No. 60/114,199, Dec. 30, 1998. This application Feb. 17, 1999, Appl. No. 251,666.

Int. Cl.[7] A61K *7/42;31/74;7/00*

U.S. Cl. 424—59 **9 Claims**

1. A cosmetic sunscreen composition comprising:

(i) from about 0.1 to about 40% by weight of an organic sunscreen agent with a chromophoric group active within the ultraviolet radiation range from 290 to 400 nm;

(ii) from about 1 to about 90% by weight of water;

(iii) from about 0.05 to about 10% of a crosslinked non-emulsifying siloxane elastomer;

(iv) from about 10 to about 80% of a volatile siloxane; and wherein the composition is an oil-in-water emulsion.

6,039,936

NANOEMULSION BASED ON NON-IONIC AND CATIONIC AMPHIPHILIC LIPIDS AND USES THEREOF

Serge Restle, Saint-Prix, and Daniéle Cauwet-Martin, Paris, both of France, assignors to L'Oreal, France

Filed Nov. 13, 1997, Appl. No. 969,796

Claims priority, application France, Nov. 15, 1996, 9613978; Mar. 18, 1997, 9703281

Int. Cl.[7] A61K *7/06*

U.S. Cl. 424—70.1 **16 Claims**

1. An oil-in-water emulsion, said emulsion comprising oil globules whose mean size is less than 150 nm and an amphiphilic lipid phase, said amphiphilic lipid phase comprising at least one non-ionic amphiphilic lipid which is liquid at an ambient temperature of less than 45° C. and at least one cationic amphiphilic lipid, the ratio by weight of the amount of oil to the amount of said amphiphilic lipid phase in said emulsion ranging from 2:1 to 10:1.

6,039,937

RAZOR CONDITIONER

Edwin P. Neubauer, 642 Cress Creek Sq., Crystal Lake, Ill. 60014

Filed Jul. 2, 1997, Appl. No. 886,910

Int. Cl.[7] A61K *7/15;7/26*

U.S. Cl. 424—73 **16 Claims**

1. A liquid composition for treating razors and razor blades comprising an oil, consisting essentially of a vegetable oil in an amount from approximately 80% up to approximately 99.99% by volume, combined with vitamin E (tocopherol acetate) in an amount from approximately 0.01% up to approximately 4% by volume.

6,039,938

BUOYANT DEODORIZER BAR

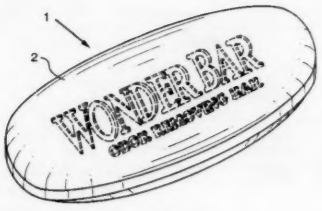
Joseph Kutchko, Rte. 910, R.D. 3, Allison Park, Pa. 15101-9803

Filed Aug. 18, 1997, Appl. No. 912,745

Int. Cl.[7] A61L *9/00*

U.S. Cl. 424—76.1 **3 Claims**

1. I claim a permanent metallic odor removing device, wherein the improvement comprises a smooth external surface made of metal alloy which when rubbed and then immersed in liquid removes odors from hands by process of absorption whereby odor molecules bond to said metal alloy and are washed away by liquid



and an internal aspect filled with air, which allows the invention to float in water.

6,039,939

N-ACYL-HYDROXYAMINO ACID ESTERS AND THEIR USE

Jakob Ley, Holzminden, and Roland Langner, Bevern, both of Germany, assignors to Haarmann & Reimer GmbH, Germany

Filed Mar. 13, 1998, Appl. No. 39,055

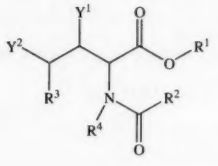
Claims priority, application Germany, Mar. 14, 1997, 197 10 612

Int. Cl.[7] A61V *31/74*

U.S. Cl. 424—78.03 **3 Claims**

1. N-Acyl-hydroxyamino acid esters of the formula

(I)



where

R^1 is a linear, branched or cyclic alkyl or alkenyl group having 5 to 50 carbon atoms and optionally one or more hydroxyl radicals,

R^2 is a linear or branched alkyl or alkenyl group having 1 to 49 carbon atoms and optionally one or more hydroxyl radicals,

Y^1 and Y^2 are, independently of one another, hydrogen or hydroxyl, and

R^3 and R^4 together are a —CH^2—or a —CH(OH)-group, and together with the chain between R^3 and R^4 form a 5-membered heterocyclic ring.

6,039,940

INHERENTLY ANTIMICROBIAL QUATERNARY AMINE HYDROGEL WOUND DRESSINGS

James J. Perrault, Vista, Calif., and Cameron G. Rouns, Pocatello, Id., assignors to Ballard Medical Products, Draper, Utah

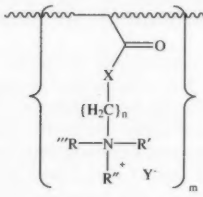
Continuation-in-part of application No. 08/738,651, Oct. 28, 1996, Pat. No. 5,800,685. This application Sep. 1, 1998, Appl. No. 144,727.

Int. Cl.[7] A61K *31/785;* **A61F** *13/00*

U.S. Cl. 424—78.06 **15 Claims**

1. A method for treating a wound with an inherently antimicrobial dressing comprising the steps of:

(a) providing a hydrogel containing from about 15 to 95 percent by weight of an inherently :ntimicrobial cationic quaternary amine acrylate polymer of the formula:



wherein n is an integer of 2 to 3; R', R" and R'" are independently selected from the group consisting of H, C_1 to C_{16} alkyl, aryl, arylamine, alkylamine, alkaryl and aralkyl; X is selected from the group consisting of O and NH; Y^- is an acceptable anionic counterion to the N^+ of the quaternary amine and m is an integer greater than 50,000 in a form suitable to cover the wound;

(b) applying said wound dressing to said wound whereby said dressing enhances the serility of the wound environment, absorbs exudate from said wound and retains said wound in a moist condition.

6,039,941

LIVE VACCINE FOR THE TREATMENT OF TUMOR DISEASES

Thomas Blankenstein, and Sophie Cayeux-Pezzutto, both of Berlin, Germany, assignors to Max-Delbrück-Centrum Für Molekulare Medizin, Berlin, Germany

PCT No. PCT/DE95/01164, § 371 Date May 20, 1997, § 102(e) Date May 20, 1997, PCT Pub. No. WO96/05866, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 18, 1995, Appl. No. 793,104

Claims priority, application Germany, Aug. 24, 1994, 44 31 401

Int. Cl.[7] **A01N** *63/00;* **A61K** *48/00;* **C12N** *15/63;15/85*

U.S. Cl. 424—93.21 **17 Claims**

1. A therapeutic agent comprising live tumor cells which have been genetically modified to comprise:

a) an operon comprising a cytokine gene and sequences necessary for its expression, and

b) an operon comprising an immunostimulatory membrane protein gene and sequences necessary for its expression, wherein the genetically modified tumor cells are autologous or allogeneic tumor cells capable of proliferation. wherein the cytokine gene codes for a substance which induces the differentiation, proliferation and activation of immune cells, and wherein the immunostimulatory membrane protein gene codes for a membrane protein that stimulates T cells.

14. A therapeutic agent comprising live tumor cells which have been genetically modified to comprise:

a) an operon comprising a cytokine gene and sequences necessary for its expression, and

b) an operon comprising an immunostimulatory membrane protein gene and sequences necessary for its expression, wherein the genetically modified tumor cells are autologous or allogeneic tumor cells capable of proliferation, wherein the cytokine is IL-4 or IL-7, and wherein the immunostimulatory membrane protein gene is the gene for T cell costimulatory molecule B7.

6,039,942

PHYTASE POLYPEPTIDES

Soren Flensted Lassen, Copenhagen; Lisbeth Bech, Hillerod; Anders Ohmann, Bronshoj; Jens Breinholt, Bagsvaerd; Claus Crone Fuglsang, Niva, and Peter Rahbek Ostergaard, Virum, all of Denmark, assignors to Novo Nordick A/S, Bagsvaerd, Denmark

Provisional application No. 60/046,082, May 9, 1997, Provisional application No. 60/046,081, May 9, 1997, Provisional application No. 60/067,304, Dec. 4, 1997. This application Dec. 18, 1997, Appl. No. 993,359.

Claims priority, application Denmark, Dec. 20, 1996, 1480/96; Dec. 20, 1996, 1481/96; Mar. 18, 1997, 0301/97; May 7, 1997, 0529/97; Dec. 1, 1997, 1388/97

Int. Cl.[7] **A61K** *38/46;* **C12N** *9/14;1/20;15/00*

U.S. Cl. 424—94.6 **15 Claims**

1. An isolated polypeptide exhibiting phytase activity, said polypeptide comprising an amino acid sequence selected from the group consisting of:

(SEQ ID NO: 1) P-[Y/F]-[F/Y]-P-X-X-X-Y-X-X-P-P; (SEQ ID NO: 2) [Q-V-[N/H]-[I/L]-I-Q-R-H-G-A-R-[F/W]-P-T-S-G-A; (SEQ ID NO: 3) [I-Q-R-H-G-A-R-[F/W]-P-T-S-G-A-X-X-R; (SEQ ID NO: 4) [R-V-V-[D/A]-[S/T]-[A/S]-[T/N]-N-W-T-[A/E]-G-F; (SEQ ID NO: 5) N-W-T-[A/E]-G-F-X-X-A-S; (SEQ ID NO: 6) G-F-X-X-A-S-X-X-X-X-X-P; (SEQ ID NO: 7) P-[N/D]-[P/E]-X-R-[T/L]-[W/F]-X-X-[SIK]-X-X-[V/T]-P-F-S; (SEQ ID NO: 8) D-[Q/A]-[V/L]-Q-P-L-X-F-C-G-[G/A]; (SEQ ID NO: 9) F-V-E-S-Q-X-[Y/F]-A-R-X-X-G-X-G-D-F-[E/A]-K-C; (SEQ ID NO: 10) N-W-T-[A/E]-G-F; (SEQ ID NO: 11) D-K-[F/Y]-Y-G-T; (SEQ ID NO: 12) D-L-D-K-[F/Y]-Y-G; (SEQ ID NO: 13) G-D-F-[A/E]-K; and (SEQ ID NO: 14) Q-V-[N/H]-[I/L]-I-Q

wherein "X" denotes any amino acid.

6,039,943

METHOD FOR ACCELERATING CLEARANCE OF HEMORRHAGIC BLOOD FROM THE VITREOUS BODY WITH HYALURONIDASE

Hampar L. Karageozian; Vicken H. Karageozian, both of San Juan Capistrano; Maria Cristina Kenney, Malibu, all of Calif.; Jose Luis Gutierrez Flores; Gabriel Arturo Carpio Aragon, both of Tijuana, Mexico, and Anthony B. Nesburn, Malibu, Calif., assignors to Advanced Corneal Systems, Irvine, Calif.

Continuation of application No. 08/561,636, Nov. 22, 1995, Pat. No. 5,866,120. This application Aug. 24, 1998, Appl. No. 139,282.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *38/43;38/46*

U.S. Cl. 424—94.62 **17 Claims**

1. A method for accelerating the clearance of hemorrhagic blood from the vitreous humor of a mammalian eye, said method comprising:

contacting with the vitreous humor an amount of a solution which contains hyaluronidase to provide a dose of at least 1 International Unit of hyaluronidase, said solution being:

i) free of thimerosal;

ii) essentially devoid of hyaluronic acid-lysing material having a molecular weight greater than 100,000;

iii) essentially devoid of caseinolytic material having a molecular weight greater than 45,000; and

iv) essentially devoid of gelatinolytic material having a molecular weight between 60,000 and 100,000.

6,039,944

MODIFIED FACTOR VII

Kathleen L. Berkner, Cleveland Heights, Ohio; Lars Christian Petersen, Hoersholm, Denmark; Charles E. Hart, Brier, Wash.; Ulla Hedner, Malmo, Sweden, and Claus Bregengaard, Hellerup, Denmark, assignors to ZymoGenetics, Inc., Seattle, Wash., and Novo Nordisk A/S, Bagsvaerd, Denmark

Division of application No. 08/327,690, Oct. 24, 1994, Pat. No. 5,817,788, which is a continuation-in-part of application No. PCT/US94/05779, May 23, 1994, and a continuation-in-part of application No. 08/065,725, May 21, 1993, abandoned, which is a continuation-in-part of application No. PCT/US92/01636, Feb. 28, 1992, and a division of application No. 07/662,920, Feb. 28, 1991, abandoned. This application Jun. 5, 1995, Appl. No. 464,233.

Int. Cl.[7] A61K *36/36;38/48;* C12N *9/48;9/64*

U.S. Cl. 424—94.64 19 Claims

1. A method for inhibiting vascular restenosis that is associated with acute vascular injury in an individual, comprising administering to the individual a therapeutically effective amount of a composition which comprises a pharmacologically acceptable Factor VII having at least one covalent modification in its catalytic center, which modification inhibits the ability of the modified Factor VII to activate plasma Factor X or IX.

6,039,945

PHARMACEUTICAL PREPARATION FOR TREATING BLOOD COAGULATION DISORDERS

Peter Turecek, Klosterneuburg/Weidling; Hans-Peter Schwarz, and Johann Eibl, both of Vienna, all of Austria, assignors to Baxter Aktiengesellschaft, Vienna, Austria

Division of application No. 08/821,763, Mar. 20, 1997, Pat. No. 5,866,122. This application Oct. 6, 1998, Appl. No. 165,745.

Claims priority, application Austria, Mar. 20, 1996, 518/96; Sep. 4, 1996, 1573/96; Sep. 20, 1996, 1673/96

Int. Cl.[7] A61K *38/48;38/00*

U.S. Cl. 424—94.64 13 Claims

1. A method of establishing a supranormal prothrombin concentration in vivo in the blood of a patient, wherein the method comprises

administering an effective dose of purified prothrombinase factors to said patient, wherein said purified prothrombinase factors lack thrombin activity.

6,039,946

EXTRACORPOREAL AFFINITY ADSORPTION DEVICES

Meir Strahilevitz, P.O. Box 190, Hansville, Wash. 98340

PCT No. PCT/US94/08043, § 371 Date Jun. 8, 1995, § 102(e) Date Jun. 8, 1995, PCT Pub. No. WO95/03084, PCT Pub. Date Feb. 2, 1995

Continuation-in-part of application No. 08/097,378, Jul. 23, 1993, Pat. No. 5,753,227. This PCT application Jul. 20, 1994, Appl. No. 464,898.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/00;* A61M *37/00*

U.S. Cl. 424—140.1 67 Claims

1. An extracorporeal device for treating a disease state having at least two chemical species associated with it, said device including means for drawing from a mammal a fluid, means in said device for exposing at least a portion of the fluid to at least a first binding means and a second affinity binding means for chemically binding at least one of said chemical species in said fluid to the first binding means and for binding at least a second of said chemical species in said fluid to a second binding means, the first chemical species being a metal ion and the first binding means being a chelant, said second affinity binding means binding specifically to a species selected from the group consisting of an anticancer drug and an anticancer drug bound to a targeting antibody, and means for returning to the mammal at least a fraction of said fluid.

6,039,947

PEPTIDES DERIVED FROM IMMUNODOMINANT EPITOPES OF MYELIN BASIC PROTEIN

Howard L. Weiner, Brookline, and David A. Hafler, West Newton, both of Mass., assignors to Autoimmune, Inc., Lexington, Mass.

Continuation of application No. 08/059,189, May 6, 1993, abandoned, which is a continuation of application No. 07/502,559, Mar. 30, 1990, abandoned, which is a continuation-in-part of application No. PCT/US88/02139, Jun. 24, 1988, abandoned, and a continuation-in-part of application No. 07/065,734, Jun. 24, 1987, abandoned. This application Aug. 11, 1994, Appl. No. 297,395.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *39/00;38/17;* C07K *7/08;14/47*

U.S. Cl. 424—184.1 3 Claims

1. A peptide the amino acid sequence of which is all or a segment of the sequence SEQ ID NO: 2 provided that said segment comprises a portion of the sequence SEQ ID NO: 1 sufficient to impart to said peptide the property of stimulating, as determined by proliferation assay, the subgroup of T-cells of the DR2+ type from remitting-relapsing multiple sclerosis patients that is reactive with another peptide the sequence of which consists of SEQ ID NO: 1, said peptide stimulating said subgroup of T-cells to about the same degree as said another peptide.

6,039,948

METHOD FOR TREATMENT OF ANTIGENICALLY MODIFIED POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to The Ohio State University, Columbus, Ohio

Division of application No. 07/935,331, Aug. 26, 1992, which is a continuation of application No. 07/311,331, Feb. 17, 1989, abandoned, which is a division of application No. 07/073,748, Jul. 15, 1987, Pat. No. 5,006,334, which is a continuation-in-part of application No. 06/667,863, Nov. 2, 1984, Pat. No. 4,691,006, which is a continuation-in-part of application No. 06/472,190, Mar. 4, 1983, Pat. No. 4,526,716, and application No. PCT/US83/00777, May 18, 1983, which is a continuation-in-part of application No. 06/472,190, which is a continuation-in-part of application No. 06/323,690, Nov. 20, 1981, Pat. No. 4,384,995, which is a continuation-in-part of application No. 06/112,628, Jan. 16, 1981, Pat. No. 4,302,386, which is a division of application No. 05/936,876, Aug. 25, 1978, Pat. No. 4,201,770, which is a continuation-in-part of application No. 05/622,031, Oct. 14, 1975, abandoned, which is a continuation-in-part of application No. 05/462,955, Apr. 22, 1974, abandoned, which is a continuation-in-part of application No. 05/406,821, Oct. 16, 1973, abandoned, which is a continuation-in-part of application No. 05/357,892, May 7, 1973, abandoned. This application Jun. 6, 1995, Appl. No. 469,043.

Int. Cl.[7] A61K *39/385;39/395;* C07K *16/18;16/26*

U.S. Cl. 424—184.1 6 Claims

1. A polypeptide linear homopolymer of at least three monomers, each monomer forming said homopolymer being substantially non-immunogenic to a mammal and comprising an amino acid sequence of the beta subunit of chorionic gonadotropin endogenous to said mammal, the linear homopolymer being substantially free of non-linear polymers and immunogenic to said mammal whereby upon administration into the body of said mammal, having a capacity to induce the formation of antibodies reactive against chorionic gonadotropin endogenous to said mammal.

6,039,949

METHOD OF PREPARATION AND COMPOSITION OF A WATER SOLUBLE EXTRACT OF THE PLANT SPECIES UNCARIA

Ronald W. Pero, Lund, Sweden, assignor to CampaMed, Inc., New York, N.Y.

Filed Feb. 27, 1997, Appl. No. 807,373

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 **18 Claims**

1. A method for preparing a water soluble extract of an Uncaria species comprising:

(a) heating a mixture of water and a substance selected from the group consisting of dried roots, bark and bark powder of said Uncaria species at a temperature of approximately 90–100° C. for such a time and at such a ratio of said substance to said water to yield a first brown extract of said mixture due to evaporation of said water;

(b) filtering said first brown extract from said mixture;

(c) centrifuging said filtered brown extract;

(d) dialyzing said centrifuged brown extract against distilled water in a dialysis tubing having an exclusion limit of up to approximately 12,000 molecular weight at approximately 4–15° C. for 20–48 hours to separate a water soluble extract of said Uncaria species; and

(e) recovering said separated water soluble extract of an Uncaria species.

6,039,950

PHARMACEUTICAL GRADE SAW PALMETTO

Tasneem A. Khwaja, Corona Del Mar, and Elliot P. Friedman, Montecito, both of Calif., assignors to University of Southern California, Los Angeles, and Pharmaprint Inc., Irvine, both of Calif.

Continuation-in-part of application No. 08/838,198, Apr. 15, 1997, abandoned, which is a continuation-in-part of application No. 08/632,273, Apr. 15, 1996, which is a continuation-in-part of application No. 08/421,993, Apr. 14, 1995, abandoned, which is a continuation-in-part of application No. 08/774,550, Feb. 4, 1997. This application Oct. 23, 1997, Appl. No. 956,601.

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 **1 Claim**

1. A method for determining a standard bioactivity for a saw palmetto extract comprising:

obtaining a sample of alcoholic saw palmetto extract;

measuring a total bioactivity for the sample by determining an IC50 in an androgen receptor binding inhibition assay;

measuring the total fatty acid content of an aliquot of the whole sample;

fractionating the sample and collecting the individual fractions;

measuring the fatty acid content of each fraction;

identifying the fractions containing linoleic acid ethyl ester and lauric acid ethyl ester;

measuring a bioactivity for each of the fractions identified in the step above with an androgen receptor binding inhibition assay;

calculating the percent activity of each of the fractions for which androgen receptor binding inhibition has been assayed compared to the total bioactivity of the sample, wherein the molecular weight and amount of the individual fatty acids identified are incorporated into the calculating; and

determining that if the total bioactivity of the sample is above a selected minimum standard amount, and if the total percent activity of the linoleic and lauric acid ethyl ester fractions is at least 25% of the total bioactivity, then the saw palmetto extract has a standard bioactivity.

6,039,951

METHOD FOR ATTAINING ERECTION OF THE HUMAN SEXUAL ORGANS

Gitte Bjeldbak, Nysumvej 15, Rold, DK-9510 Arden, Denmark

Continuation-in-part of application No. PCT/DK97/00085, Feb. 27, 1997. This application Sep. 8, 1998, Appl. No. 149,515.

Claims priority, application Denmark, Mar. 11, 1996, 0279/96

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. A method for attaining an erection of a human sexual organ comprising applying a composition comprising an effective amount of a chili pepper extract and a carrier selected from the group consisting of lubricants, oils and creams and mixtures thereof topically to the sexual organ.

6,039,952

COMPOSITION AND METHOD FOR IMPROVING CLINICAL SIGNS IN ANIMALS WITH RENAL DISEASE

Gregory D. Sunvold, Eaton; Mark A. Tetrick, and Gregory A. Reinhart, both of Dayton, all of Ohio, assignors to The Iams Company, Dayton, Ohio

Provisional application No. 60/063,490, Oct. 22, 1997. This application Oct. 21, 1998, Appl. No. 176,440.

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 **14 Claims**

1. A low-phosphorus pet food composition comprising from about 10 to about 32% crude protein, from about 8 to about 20% fat, and from about 3 to about 25% total dietary fiber, and wherein said composition has less than about 0.25% phosphorus, all percentages by weight (dry matter basis).

6,039,953

HIGHLY CONCENTRATED MINERALISED NATURAL COMPLEX FOR THE INTEGRATION OF MINERAL OLIGOELEMENTS AND METHOD FOR ITS PRODUCTION

Valentino Mercati, Città di Castello, Italy, assignor to Aboca di Mercati Valentino & C. Societa Semplice, Sansepolcro Arezzo, Italy

Filed Nov. 18, 1998, Appl. No. 195,249

Claims priority, application European Pat. Off., Dec. 23, 1997, 97830706

Int. Cl.[7] A61K *35/78;33/24*

U.S. Cl. 424—195.1 **7 Claims**

1. A method for production of an inorganic mineral concentrate product, comprising obtaining a plurality of organic starting materials of vegetable origin having a mineral content, determining the mineral content of the plurality of organic starting materials, mixing said starting materials together to obtain a mixture having a mineral content corresponding to the product, and removing organic material from the mixture by heating the mixture at a temperature of 200° to 400° C. for 1 to 3 hours to obtain a light colored inorganic product, followed by heating the mixture to a temperature of 500° to 900° C. for 3 to 5 hours, to obtain the inorganic mineral concentrate product.

6,039,954

HERBAL COMPOSITIONS FOR TREATMENT OF GASTROINTESTINAL DISORDERS

Yu Long Yu, Edensor Park, and Alan Bensoussan, Lane Cove, both of Australia, assignors to Chinese Medicines Scientific Consultants Pty Ltd., Chatswood, Australia

Filed Mar. 24, 1999, Appl. No. 275,653

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 27 Claims

1. A composition comprising the herbs *Ledebouriellae Sesloidis, Bupleurum Chinense, Artemesiae Capillaris, Fraxini, Plantaginis, Paeoniae Lactiflorae* and *Schizandrae.*

6,039,955

NONTOXIC EXTRACT OF *LARREA TRIDENTATA* AND METHOD OF MAKING THE SAME

Robert A. Sinnott, Chandler; W. Dennis Clark, Phoenix, both of Ariz., and Kenneth Frank DeBoer, Belgrade, Mont., assignors to Larreacorp, Ltd., Chandler, Ariz.

Division of application No. 09/152,055, Sep. 11, 1998, which is a division of application No. 08/726,686, Oct. 7, 1996, Pat. No. 5,837,252, Provisional application No. 60/020,946, Jul. 1, 1996. This application Jun. 10, 1999, Appl. No. 329,359.

Int. Cl.[7] A61K *35/78*

U.S. Cl. 424—195.1 10 Claims

1. An agent for treatment of inflammation, comprising a concentrated extract of reduced NDGA-containing *Larrea tridentata* plant material and ascorbic acid, wherein the NDGA is reduced as a result of a chemical reaction between said extract and said ascorbic acid such that said ascorbic acid is provided at a concentration sufficient to saturate said extract prior to the concentration of said extract.

6,039,956

CORTICOTROPIN RELEASE INHIBITING FACTOR AND METHODS OF USING SAME FOR TREATING BEHAVIORAL SYMPTOMS IN AN ANXIETY DISORDER

Eva Redei, Chicago; Fraser Aird, Oak Park, both of Ill.; Peter A. Rittenhouse, Philadelphia, Pa., and Robert F. McGivern, San Diego, Calif., assignors to Pennsylvania, Trustees of the University of, The, Philadelphia, Pa.

Continuation-in-part of application No. 08/523,125, Sep. 8, 1995, Pat. No. 5,830,866, which is a continuation-in-part of application No. 08/304,383, Sep. 12, 1994, abandoned. This application Jun. 7, 1996, Appl. No. 660,561.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *38/06*

U.S. Cl. 424—198.1 7 Claims

1. A method of treating behavioral symptoms in an anxiety disorder in a human comprising administering corticotropin release inhibiting factor to said human in an amount sufficient to alleviate said behavioral symptoms, wherein said corticotropin release inhibiting factor comprises at least three contiguous amino acids contained within the amino acid sequence positioned between the fourth and fifth thyrotropin releasing hormone sequence on a prepro-thyrotropin releasing hormone protein.

6,039,957

OLIGOMERIC HIV-1 ENVELOPE GLYCOPROTEINS

Patricia L. Earl, ChevyChase; Christopher C. Broder, Rockville, both of Md.; Robert W. Doms, Berwyn, Pa., and Bernard Moss, Bethesda, Md., assignors to United States of America, as represented by the Department of Health and Human Services, Washington, D.C.

Division of application No. 08/165,314, Dec. 10, 1993, abandoned. This application Mar. 3, 1997, Appl. No. 805,889.

Int. Cl.[7] A61K *39/21*

U.S. Cl. 424—208.1 5 Claims

1. A method of producing neutralizing antibodies against conformational epitopes of HIV-1 envelope proteins in a human, comprising:

administering to a human a recombinant uncleaved gp140 protein retaining its oligomeric structure so that said human produces neutralizing antibodes against conformational epitopes of HIV-1 envelope proteins found on the oligomeric structure of said gp 140, said gp140 protein being defined as a C-terminally truncated form of HIV-1 gp160 protein that is missing the gp41 transmembrane domain.

6,039,958

STABILIZED LIVE VACCINE

Kuniaki Koyama, and Juichiro Osame, both of Mitoyo-gun, Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

Division of application No. 08/322,036, Oct. 12, 1994, Pat. No. 5,948,411, which is a continuation of application No. 07/929,374, Aug. 14, 1992, abandoned. This application Oct. 28, 1998, Appl. No. 179,970.

Claims priority, application Japan, May 5, 1992, 4-157236; May 15, 1992, 4-148476

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A01N *63/00;* A61K *39/12;39/25*

U.S. Cl. 424—230.1 10 Claims

1. A stabilized live vaccine comprising a virus component comprising: (i) at least one varicella virus selected from the group consisting of an attenuated live varicella virus and an attenuated recombinant varicella virus and (ii) a stabilizer comprising

(a) from 0.5 to 10%(w/v) of sucrose or a mixture of from 0.5 to 10%(w/v) of lactose, from 0.2to 6.0%(w/v) of sorbitol and from 0.02to 1.0%(w/v) of cysteine;

(b) from 0.01 to 5.0%(w/v) of sodium glutamate;

(c) from 0.02 to 1.0%(w/v) of gelatin;

(d) from 0.5 to 10%(w/v) of hydrolyzed gelatin; and

(e) from 0.001 to 0.1%(w/v) of a chelating reagent; in terms of the concentration in the stabilized live vaccine; so that said vaccine is substantially free of Ca^{2+} ions and Mg^{2+} ions to the extent that Ca^{2+} ions and Mg^{2+} ions are substantially not detected by a colorimetric titration method using a chelating reagent.

6,039,959

TREATMENT AND DIAGNOSIS OF INFECTIONS DUE TO HELICOBACTER PYLORI

James Peter Burnie, Alderley Edge, United Kingdom, assignor to NeuTec Pharma plc, United Kingdom

PCT No. PCT/GB96/02907, § 371 Date Jun. 8, 1998, § 102(e) Date Jun. 8, 1998, PCT Pub. No. WO97/21103, PCT Pub. Date Jun. 12, 1997

PCT Filed Nov. 27, 1996, Appl. No. 91,001

Claims priority, application United Kingdom, Dec. 6, 1995, 9524934

Int. Cl.[7] A61K *39/02*

U.S. Cl. 424—234.1 7 Claims

1. A method of treating *Helicobacter pylori* infection comprising providing epitope EVGKVA (SEQ ID NO:11), selecting an antibody to said epitope, and administering said antibody or a fragment thereof to an individual at risk from *H. pylori* infection.

6,039,960

WATER CONTAINING WAX-BASED PRODUCT

Kenny Chung, Dix Hills; Tracy N. Keeler, East Northport, and Manuel L. Tan, Westbury, all of N.Y., assignors to E-L Management Corp., New York, N.Y.

Filed May 28, 1997, Appl. No. 864,162

Int. Cl.[7] A61K *7/135*

U.S. Cl. 424—401 16 Claims

1. A wax-based composition for application to the skin, comprising a water-in-oil emulsion, the emulsion comprising (a) about 70–99.5% of an oil phase, the oil phase comprising about 10 to about 40% of one or more waxes, and (b) about 0.5–30% of an aqueous phase comprising water and water solubles actives, wherein water is encapsulated in a lamellar lipid vesicle capable of withstanding wax melting point temperatures, wherein the vesicle comprises at least one polyoxyethylene fatty ether having a melting point greater than that of the melting point of the wax in the composition.

6,039,961

LIPOPHILIC HYDROXYLATED ACID, ITS USE IN COSMETICS AND PHARMACY, AND ITS PROCESS OF PREPARATION

Eric Perrier, Vienne; Daniele Antoni, Vernaison, and Alain Huc, Sainte fdy les Lyon, all of France, assignors to Coletica, Lyons, France

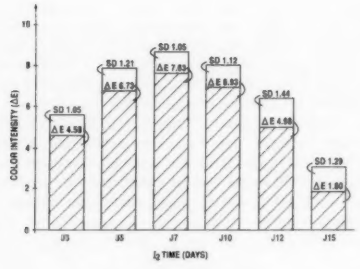
Division of application No. 08/557,154, Feb. 16, 1996, Pat. No. 5,869,069, which is a continuation-in-part of application No. 08/354,228, filed as application No. PCT/FR95/00984, Jul. 21, 1995, abandoned. This application Apr. 27, 1998, Appl. No. 66,587.

Claims priority, application France, Jul. 22, 1994, 94 09091

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *7/00*

U.S. Cl. 424—401 23 Claims



1. A lipophilic salicylic acid compound which is the reaction product of salicylic acid with at least one hydrophobic hydrocarbon compound selected from the group consisting of a halide or anhydride of stearic acid, a halide or anhydride of palmitic acid, a halide or anhydride of myristic acid, a halide or anhydride of lauric acid, a halide or anhydride of undecylenic acid, a halide or anhydride of oleic acid, a halide or anhydride of linoleic acid, and a halide or anhydride of linolenic acid, wherein said lipophilic salicylic acid compound is in a final reaction mixture of the lipophilic salicylic acid compound with the unreacted salicylic acid and the unreacted hydrophobic hydrocarbon compound, and the ratio by weight of the salicylic acid to the hydrophobic hydrocarbon compound ranges between 0.05 and 10.

6,039,962

COSMETIC COMPOSITIONS CONTAINING A LIPID CERAMIDE COMPOUND AND A PEPTIDE HAVING A FATTY CHAIN, AND THEIR USES

Daniele Cauwet-Martin, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oréal, Paris, France

Continuation of application No. 08/535,671, Sep. 28, 1995, Pat. No. 5,830,481. This application Jun. 5, 1998, Appl. No. 92,074.

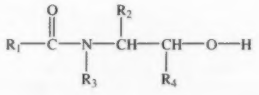
Claims priority, application France, Sep. 29, 1994, 94 11666

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *7/48*

U.S. Cl. 424—401 25 Claims

1. A cosmetic composition comprising, in a cosmetically acceptable aqueous medium, from 0.0001 to 10% by weight relative to the total weight of the composition of at least one lipid ceramide compound and from 0.01 to 30% by weight relative to the total weight of the composition of at least one peptide having at least one fatty chain, wherein said at least one peptide is a protein hydrolysate and wherein said at least one lipid ceramide compound has the formula (I):



in which:

R_1 denotes either a saturated or unsaturated, linear or branched C_9–C_{30} hydrocarbon radical, it being possible for R_1 to be substituted with one or more hydroxyl groups or with one or more hydroxyl groups esterified with a saturated or unsaturated C_{16}–C_{30} fatty acid; or a radical R"—NR—CO—R'—, wherein R denotes hydrogen or a mono- or polyhydroxylated C_1–C_{10} hydrocarbon radical, R' and R" are hydrocarbon radicals in which the sum of the carbon atoms is from 9 to 30, R' being a bivalent radical,

R_2 denotes a hydrogen atom or a saturated or unsaturated C_{16}–C_{27} hydrocarbon radical, it being possible for R_2 to be substituted with one or more C_1–C_{14} alkyl radicals; a C_{15}–C_{26} α-hydroxyalkyl radical; or a C_{15}–C_{26} α-hydroxyalkyl radical where the hydroxyl group is esterified with a C_{16}–C_{30} α-hydroxy acid,

R_3 denotes a hydrogen atom, a saturated or unsaturated C_{16}–C_{27} hydrocarbon radical or a radical —CH_2—CHOH—CH_2—O—R_6 in which R_6 denotes a C_{10}–C_{26} hydrocarbon radical,

R_4 denotes a hydrogen atom or a mono- or polyhydroxylated C_1–C_4 hydrocarbon radical and wherein said composition does not contain a glycoceramide compound.

6,039,963

CERAMIDE COMPOUNDS, PROCESS FOR THEIR PREPARATION AND USE

Michel Philippe, Wissous; Bernadette Luppi, Sevran, and Didier Semeria, Courtry, all of France, assignors to L'Oreal, Paris, France

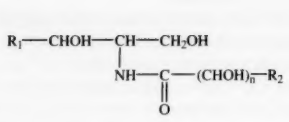
Division of application No. 08/628,169, Apr. 5, 1996, Pat. No. 5,869,711. This application Nov. 12, 1998, Appl. No. 189,837.

Claims priority, application France, Apr. 5, 1995, 95 04050

Int. Cl.[7] A61K *6/00;* C07C *233/00*

U.S. Cl. 424—401 18 Claims

1. A cosmetic or dermatological composition comprising from 0.005 to 20% by weight of at least two compounds corresponding to the formula (I):



(I)

in which:

R_1 denotes a saturated or unsaturated C_{10} to C_{25} hydroxylated hydrocarbon radical;

n is equal to 0 or 1;

R_2, when n is equal to 1, denotes a linear or branched, saturated or unsaturated C_1 to C_{31} hydrocarbon radical; and R_2, when n is equal to 0, denotes a linear or branched, saturated or unsaturated C_2 to C_{31} hydrocarbon radical;

said at least two compounds being in the form of a mixture of at least two isomers at least on the amino alcohol part of the formula (I);

said at least two compounds further being in the presence of an adjuvant selected from fatty substances, solvents, water, thickening agents, emulsifying agents, moisturizing products, softeners, sunscreens, germicides, dyes, preserving agents, fragrances, propellants and surfactants.

6,039,964

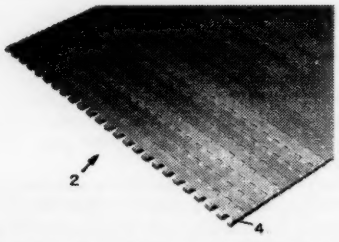
GERMICIDALLY PROTECTED CONVEYOR COMPONENTS

Mohan L. Sanduja, Flushing; Carl Horowitz, Brooklyn; Mohammed Kamruzzaman, Bronx; Paul Thottathil, New Hyde Park, all of N.Y., and Earl A. Ramsey, Sinking Springs, Pa., assignors to Omni Manufacturing, Inc., Sinking Spring, Pa.

Filed Apr. 11, 1997, Appl. No. 835,931

Int. Cl.[7] **A01N** *25/34;* **B65G** *15/30*

U.S. Cl. 424—404 **11 Claims**



1. A conveyor component have germicidal properties comprising a solid unitary polymeric material and a polymerized salt of a polymerizable monomer and a germicidal agent grafted to said polymeric material and distributed uniformly throughout said polymeric material.

6,039,965

SURFANCTANTS FOR REDUCING BACTERIAL ADHESION ONTO SURFACES

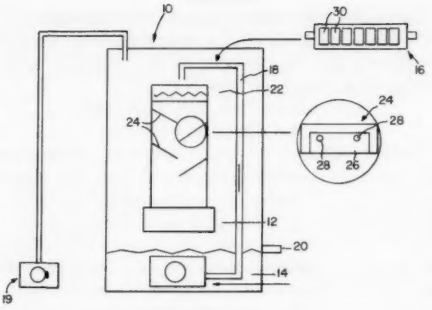
Rodney M. Donlan, Bridgeville; David L. Elliot, Imperial; Nancy J. Kapp, Glenshaw; Christopher L. Wiatr, McMurray, and Paul A. Rey, Moon Township, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Provisional application No. 60/026,909, Sep. 27, 1996, Provisional application No. 60/026,844, Sep. 27, 1996. This application Sep. 15, 1997, Appl. No. 929,909.

Int. Cl.[7] **A01N** *25/04*

U.S. Cl. 424—405 **21 Claims**

1. A method for inhibiting adhesion of microorganisms to a hydrophobic surface in contact with a freshwater recirculating



aqueous system, the method comprising adding at least 0.25 ppm of at least one compound comprising an ethoxylated nonionic surfactant which is block copolymer of repeating ethylene oxide and repeating propylene oxide units to the aqueous system.

6,039,966

AGROCHEMICAL EMULSION CONCENTRATES

Stanley J. Kostka, Cherry Hill, and Rennan Pan, Plainsboro, both of N.J., assignors to Aquatrols Corporation of America, Inc., Cherry Hill, N.J.

Provisional application No. 60/070,101, Dec. 30, 1997. This application Dec. 16, 1998, Appl. No. 212,995.

Int. Cl.[7] **A01N** *25/00;57/00;43/40;43/36*

U.S. Cl. 424—405 **11 Claims**

1. An agrochemical emulsion concentrate comprising

a) from about 10 to about 60 percent by weight of a water-insoluble pesticide having a melting point of less than about 110° C.;

b) from about 20 to about 60 percent by weight of a water-soluble alkoxylated acid composition wherein said acid composition comprises:

i) from greater than about 25 to about 60 percent by weight alkoxylated rosin acids; and

ii) from about 40 to less than about 75 percent by weight alkoxylated fatty acids wherein the rosin acids and fatty acids have an average molar addition of from about 6 to about 20 alkoxy moieties per molecule of acid, the weight percents of the rosin and fatty acids being based on the total weight of said alkoxylated acids; and

c) from about 15 to about 45 percent by weight of nonionic surfactant; wherein the emulsion concentrate having 20 weight percent of said pesticide, is stable at room temperature for at least three weeks and the weight percents are based on the total weight of the emulsion concentrate except where indicated.

6,039,967

INTRAVESICAL DRUG DELIVERY SYSTEM

Thomas B. Ottoboni, Belmont; Ronald K. Yamamoto, San Francisco, and Stanley R. Conston, San Carlos, all of Calif., assignors to Point Biomedical Corporation, San Carlos, Calif.

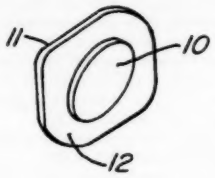
Continuation-in-part of application No. 08/833,247, Apr. 3, 1997. This application Apr. 2, 1998, Appl. No. 54,154.

Int. Cl.[7] **A61F** *2/02;6/06;* **A61K** *47/30*

U.S. Cl. 424—426 **29 Claims**

1. A bioerodible, sustained-release preparation for placement into the bladder through the urethra,

comprising a pharmaceutically active ingredient and a bioerodible pharmaceutically acceptable carrier;



said carrier being capable of sustained delivery within the bladder of said active ingredient and said carrier being excretable through the urinary tract after bioerosion.

6,039,968

INTRAVAGINAL DRUG DELIVERY DEVICE

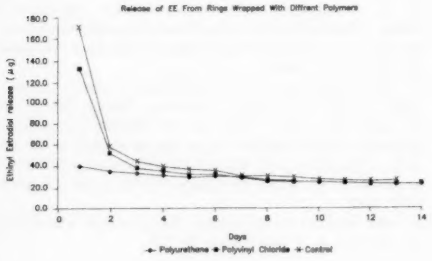
Shohre Nabahi, Watchfield, United Kingdom, assignor to Hoechst Marion Roussel, France

Filed Jun. 22, 1998, Appl. No. 102,302

Claims priority, application United Kingdom, Jun. 24, 1997, 9713360; Nov. 24, 1997, 9724777

Int. Cl.[7] A61F *13/02*

U.S. Cl. 424—433 **22 Claims**



1. An intravaginal drug delivery system having a first intravaginal part comprising at least one active agent in a polymer matrix, said first part being provided in association with a second part comprising a polymer membrane to be removed before use which absorbs active agent.

6,039,969

IMMUNE RESPONSE MODIFIER COMPOUNDS FOR TREATMENT OF TH2 MEDIATED AND RELATED DISEASES

Mark A. Tomai, Oakdale, Minn.; David M. Hammerbeck, Houlton, Wis., and Karl F. Swingle, Oakdale, Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Provisional application No. 60/029,301, Oct. 25, 1996, Provisional application No. 60/045,331, May 1, 1997. This application Oct. 24, 1997, Appl. No. 957,192.

Int. Cl.[7] A61F *13/02*

U.S. Cl. 424—434 **12 Claims**

1. A method of treating a non-viral and non-tumor, TH2 cell mediated disease comprising administering an immune response modifier compound selected from the group consisting of imidazoquinoline amines, imidazopyridine amines, 6,7-fused cycloalkylimidazopyridine amines, and 1,2-bridged imidazoquinoline amines in an amount effective to inhibit TH2 cell mediated immune response, with the proviso that said disease is other than eczema.

6,039,970

PROCESS FOR THE PREPARATION OF MICROSPHERES CONTAINING BIOLOGICALLY ACTIVE COMPONENTS

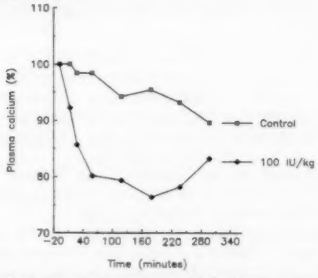
Lanfranco Callegaro, Padua; Aurelio Romeo, Rome, and Luca Benedetti, Vicenza, all of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Division of application No. 08/169,558, Dec. 20, 1993, which is a continuation of application No. 07/890,108, May 29, 1992, abandoned. This application Jan. 13, 1999, Appl. No. 231,353.

Claims priority, application Italy, May 31, 1991, PD91A0102

Int. Cl.[7] A61K *9/16*

U.S. Cl. 424—434 **6 Claims**



1. A method for administering a biologically active molecule across the nasal mucosal membrane which comprises administering an effective amount of a smooth surface microsphere which comprises a biologically active molecule and an ester of hyaluronic acid,

wherein said biologically active molecule is adhered to said ester of hyaluronic acid,

wherein said smooth surface microsphere has a diameter of between 1 µm to 100 µm, and

wherein said smooth surface microsphere is formed by a process comprising:

dissolving said ester of hyaluronic acid and said biologically active molecule in dimethylsulfoxide to produce a mixture;

adding said mixture to mineral oil with stirring to produce an emulsion;

adding ethyl acetate to said emulsion to produce a suspension;

filtering said suspension; and

recovering smooth surface microspheres thus formed, to said nasal mucosal membrane.

6,039,971

COMPOSITION FOR SKIN PATCH PREPARATION AND PROCESS FOR PREPARING THE SAME

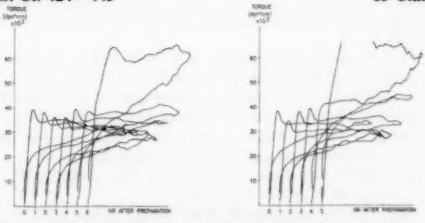
Akihiko Kusunoki; Naohisa Kawamura; Yoshiki Sugizaki, all of Saitama-ken, and Akio Kuwahara, Fukuoka-ken, all of Japan, assignors to Saitama Daiichi Pharmaceutical Co., Ltd., Kasukabe, Japan

Filed Feb. 18, 1998, Appl. No. 25,191

Claims priority, application Japan, Mar. 24, 1997, 9-088735

Int. Cl.[7] A61K *9/70;* **A61L** *5/60*

U.S. Cl. 424—443 **15 Claims**



1. A composition for a skin patch preparation comprising a synthetic water holding polymer gel prepared by reacting, in the presence of water and at a pH of 4.0 to 6.1, a water-aoluble

polymer of an aliphatic carboxylic acid or a salt thereof in an amount of 1 to 30% by weight based on the total weight of the composition, with a sparingly soluble aluminum compound in an amount of 0.2 to 15% by weight in terms of aluminum based on the weight of said water-soluble polymer, a reaction accelerator consisting essentially of an organic acid containing a hydroxyl group in its molecule, said organic acid being selected from the group consisting of glycolic acid, lactic acid, malic acid, tartaric acid, gluconic acid and salicylic acid, said organic acid being present in an amount effective to increase the reaction rate of said water-soluble polymer and said aluminum compound, and a reaction inhibitor consisting essentially of an ethylenediamine compound, said ethylenediamine compound being present in an amount effective for control of the rate of initiation of gelation.

6,039,972

WOUND DRESSING CONTAINING MAMMALIAN CELLS ANCHORED ON HYDROPHOBIC SYNTHETIC POLYMER FILM

Yvonne Margaret Barlow, Sawston, and Stephen Michael Lang, Saffron Walden, both of United Kingdom, assignors to Smith & Nephew PLC, United Kingdom

Continuation of application No. 08/436,839, May 8, 1995, Pat. No. 5,712,137, which is a continuation of application No. 08/191,057, Feb. 2, 1994, abandoned, which is a continuation of application No. 07/752,659, Aug. 21, 1991, abandoned. This application Jan. 20, 1998, Appl. No. 9,673.

Claims priority, application United Kingdom, Mar. 5, 1990, 90049115; WIPO, Mar. 4, 1991, PCT/GB91/00329

Int. Cl.[7] **A61L** *15/00;* **C12N** *11/08;5/00;* **A61F** *13/00*

U.S. Cl. 424—445 **5 Claims**

1. A conformable wound dressing adapted for transfer to a wound site comprising a layer of cultured mammalian cells anchored to one surface of a conformable substrate which is a film of synthetic polymer having a thickness not exceeding 0.075 mm, and which substrate is hydrophobic, with a water uptake not exceeding 10% by weight thereof, non-inhibitory to cell growth and non-cytotoxic.

6,039,973

Patent Not Issued For This Number

6,039,974

PHARMACEUTICAL COMPOSITION FOR COMBINATION OF PIPERIDINOALKANOL-DECONGESTANT

David D. MacLaren; John R. Lefler, both of Overland Park, Kans., and Sharon K. Minish, Independence, Mo., assignors to Hoechst Marion Roussel, Inc., Bridgewater, N.J.

Provisional application No. 60/090,105, Aug. 26, 1997. This application Jul. 31, 1998, Appl. No. 127,478.

Int. Cl.[7] **A61K** *9/22;9/24;9/28*

U.S. Cl. 424—472 **13 Claims**

1. A pharmaceutical composition in the form of a bilayer tablet comprising,

(a) a first discrete zone made with Formulation (A) which comprises, a therapeutically effective decongestant amount of a sympathomimetic drug, or a pharmaceutically acceptable salt thereof, in an amount of about 18% to about 39% by weight of Formulation (A), and a first carrier base material, the first carrier base material comprising a mixture of;

(I) carnauba wax in an amount of about 59% to about 81% by weight of Formulation (A); and

(ii) a suitable antiadherent in an amount of about 0.25% to about 2.00% by weight of Formulation (A);

wherein said first carrier base material provides a sustained release of the sympathomimetic drug; and

(b) a second discrete zone made with Formulation (B) which comprises a therapeutically effective antihistaminic amount of a piperidinoalkanol, or a pharmaceutically acceptable salt thereof, in an amount of about 15% to about 30% by weight of Formulation (B) and a second carrier base material, the second carrier base comprising a mixture of;

(I) a cellulose diluent in an amount of about 27% to about 73% by weight of Formulation (B);

(ii) pregelatinized starch in an amount of about 15% to about 30% by weight of Formulation (B);

(iii) a suitable disintegrant in an amount of about 0.25% to about 6.00% by weight of Formulation (B); and

(iv) a suitable lubricant in an amount of about 0.25% to about 2.00% by weight of Formulation (B);

wherein said second carrier base material provides an immediate release of the piperidinoalkanol or the pharmaceutically acceptable salt thereof.

6,039,975

COLON TARGETED DELIVERY SYSTEM

Navnit Hargovindas Shah; Aruna M. Railkar, both of Clifton, and Wantanee Phuapradit, Jersey City, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Provisional application No. 60/005,704, Oct. 17, 1995. This application Sep. 20, 1996, Appl. No. 717,032.

Int. Cl.[7] **A61K** *9/24*

U.S. Cl. 424—473 **14 Claims**

1. A drug delivery system comprising:

a) a core containing a therapeutically effective amount of a biologically-active compound and a swelling agent said swelling agent being present in an amount of from about 5 to about 50% w/w of the core;

b) a semi-permeable polymer membrane encasing the core which allows water influx but prevents outward diffusion of the biologically active compound, said membrane including a plasticizer, which plasticizer is present in an amount of from about 10 to about 30% w/w of the membrane, wherein the membrane has a percent elongation of from about 2 to about 3.5%; and

c) an outer enteric coating encasing the membrane which coating dissolves at or above about pH 5.5.

6,039,976

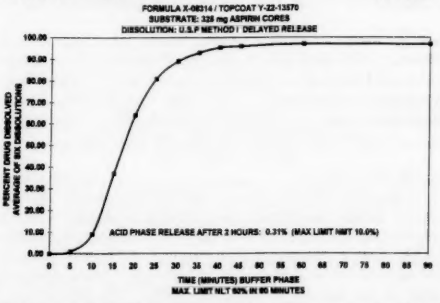
ENTERIC FILM COATING COMPOSITIONS, METHOD OF COATING THEREWITH, AND COATED FORMS

Dev K. Mehra, Furlong; Chittamuru Ramireddy, Lansdale; Li-Juan Tang, Norristown, and Stuart C. Porter, Hatfield, all of Pa., assignors to BPSI Holdings, Inc., Wilmington, Del.

Division of application No. 08/319,987, Oct. 7, 1994, Pat. No. 5,733,575. This application Nov. 26, 1997, Appl. No. 979,537.

Int. Cl.[7] **A61K** *9/32;* **C08K** *5/09*

U.S. Cl. 424—480 **35 Claims**



1. A non-toxic edible aqueous enteric coating suspension for use in coating pharmaceutical tablets, comprising

an enteric film forming polymer,
a detackifier,
a viscosity modifier,
an alkalizing agent,
a plasticizer,
an antifoaming agent,
and water.

6,039,977

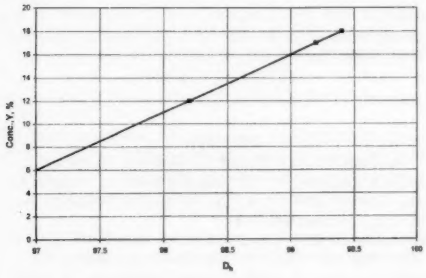
PHARMACEUTICAL HYDROGEL FORMULATIONS, AND ASSOCIATED DRUG DELIVERY DEVICES AND METHODS

Subramanian S. Venkatraman, Palo Alto, Calif.; Thomas O. Murdock, Vadnais Heights, Minn., and Stephanus Pudjijanto, San Jose, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Dec. 9, 1997, Appl. No. 987,372

Int. Cl.[7] **A61K** *9/10;47/32;* **A61M** *37/00*

U.S. Cl. 424—486 **7 Claims**



1. A method for eliminating or reducing syneresis in a pharmaceutical hydrogel formulation comprised of (a) a therapeutically effective amount of a drug in (b) a hydrogel comprised of water and polyvinyl alcohol having an average viscosity molecular weight between approximately 10,000 and 400,000, wherein the polyvinyl alcohol has a predetermined degree of hydrolysis D_h between approximately 95% and 99% and represents Y percent by weight in a range of approximately 10 wt. % to 30 wt % of the hydrogel, the method comprising

a. selecting Y and D_h to correspond to each other such that if D_h is greater than approximately 97.5% then Y is greater than or equal to approximately $5D_h$–479 or if D_h is less than approximately 97.5% then Y is greater than or equal to approximately $4.16D_h$–385;

b. preparing a solution of polyvinyl alcohol having the parameters selected from step a

c. subjecting said solution to at least a single-cycle freeze-thaw procedure if Dh is greater than approximately 97.5% or subjecting said solution to a multi-cycle freeze-thaw procedure if Dh is less than approximately 97.5%

which provides for a stable hydrogel and reduces or eliminates syneresis upon storage of the formulation for at least six months at a storage temperature in the range of approximately 5° C. to 40° C.

6,039,978

DIETARY FOOD ENHANCEMENT AGENT

William E. Bangs, Philadelphia, Pa.; Chor San Heng Khoo, Mt. Laurel, N.J., and Sandy Ko, Abington, Pa., assignors to Campbell Soup Company, Camden, N.J.

PCT No. PCT/US96/10225, § 371 Date Sep. 20, 1996, § 102(e) Date Sep. 20, 1996, PCT Pub. No. WO96/39053, PCT Pub. Date Dec. 12, 1996

Continuation-in-part of application No. 08/471,202, Jun. 6, 1995, abandoned. This PCT application Jun. 6, 1996, Appl. No. 716,421.

Int. Cl.[7] **A61K** *9/14;* **A23L** *1/303;1/304*

U.S. Cl. 424—489 **12 Claims**

1. A homogenous, powdered, freeflowing, and stable dietary food enhancement agent for fortifying food products comprising a premixed combination including a source of calcium, a source of magnesium, and a source of phosphorus, wherein said source of calcium is calcium citrate and dicalcium phosphate, said source of phosphorus is dicalcium phosphate and magnesium phosphate, and said source of magnesium is magnesium phosphate; wherein said source of magnesium, said source of phosphorus and said source of calcium comprise in a range of about 73% to about 92% of said agent by weight.

3. A homogenous, powdered, freeflowing, and stable dietary food enhancement agent for fortifying food products comprising a premixed combination including sources of phosphorous and magnesium, wherein said source of phosphorous is magnesium phosphate and said source of magnesium is magnesium phosphate and magnesium oxide and wherein said premixed combination further comprises a source of calcium, and said source of calcium is calcium carbonate; wherein said source of magnesium, said source of phosphorus and said source of calcium comprise in a range of about 38% to about 71% of said agent by weight.

6,039,979

MULTIPARTICULATE PHARMACEUTICAL FORM WITH PROGRAMMED AND PULSED RELEASE AND PROCESS FOR ITS PREPARATION

Edouard Gendrot, Garnay; Gérard Cousin, Le Mesnil Ponceau; Françoise Ragot, Leves, and Marie-Christine Clee-Bouvet, Treon, all of France, assignors to Laboratoires Prographarm, France

Filed Jan. 13, 1999, Appl. No. 229,864

Int. Cl.[7] **A61K** *9/14*

U.S. Cl. 424—497 **15 Claims**

1. Multiparticulate pharmaceutical form with delayed and pulsed release of the active ingredient, enabling to obtain the onset of the availability of the active ingredient within 4 to 8 hours after the ingestion of the pharmaceutical form, and then to progressive release of the totality of the active ingredient within the 8 to 20 following hours, the said multiparticulate pharmaceutical form which is free of organic acid, comprising medicinal spheroids including each a neutral spherical core enveloped by a first coating based on a mixture of at least one hydrosoluble polymer and of at least one non hydrosoluble polymer throughout which are uniformly distributed the constitutive particles of an active ingredient, the cores coated with the first coating comprising a second coating based on at least two pH independent polymers presenting rates of permeability different from one another with respect to the gastric and intestinal mediums.

6,039,980

SUSTAINED RELEASE EXCIPIENT

Anand R. Baichwal, Wappinger Falls, N.Y., assignor to Edward Mendell Co., Inc., Patterson, N.Y.

Continuation of application No. PCT/US97/03455, Jan. 29, 1997, Provisional application No. 60/010,722, Jan. 29, 1996. This application Jul. 29, 1998, Appl. No. 124,576.

Int. Cl.[7] **A61K** *9/20*

U.S. Cl. 424—500 **20 Claims**

1. An oral solid dosage form comprising:

a therapeutically effective amount of a medicament; and

a sustained release excipient comprising from about 10 to about 40 percent of a gelling agent by weight of said sustained release excipient said gelling agent consisting of a galactomannan, from about 1 to about 20 by weight percent of an ionizable gel strength enhancing agent by weight of said excipient, such that the ratio of said galactomannan to said ionizable gel strength enhancing agents from about 1:1 to about 3.5:1

and from about 60 to about 85 percent by weight of an inert pharmaceutical diluent by weight of the sustained release excipient.

6,039,981

ANTIFUNGAL ORAL COMPOSITION CONTAINING ITRACONAZOLE AND PROCESS FOR PREPARING SAME

Jong-Soo Woo, Suwon, and Hong-Gi Yi, Kyungki-do, both of Rep. of Korea, assignors to Hanmi Pharm. Co. Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 4, 1999, Appl. No. 411,510

Claims priority, application Rep. of Korea, Jun. 16, 1999, 99-22472

Int. Cl.[7] **A61K** *33/42;31/495*

U.S. Cl. 424—601 **5 Claims**

1. An antifungal composition for oral administration comprising a fused mixture of itraconazole and phosphoric acid, a pharmaceutically acceptable carrier and a surfactant.

6,039,982

USE OF A DEAMINATING OXIDASE IN BAKING

Peter Wagner, Holte, Denmark, and Joan Qi Si, Laufen, Switzerland, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of application No. PCT/DK96/00500, Dec. 2, 1996. This application Apr. 23, 1998, Appl. No. 65,398.

Claims priority, application Denmark, Dec. 8, 1995, 1402/95; Dec. 11, 1995, 1405/95

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A21D** *2/00*

U.S. Cl. 426—18 **17 Claims**

1. A method for preparing a dough or a baked product produced from the dough, comprising adding to dough or dough ingredients an L-amino acid oxidase or a benzylamine oxidase in an amount effective to improve gluten strength, stickiness, or rheological properties of dough, or specific volume of the baked product.

6,039,983

USE OF A PYRANOSE OXIDASE IN BAKING

Peter Wagner, Holte, and Joan Qi Si, Laufen, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Germany

Continuation of application No. PCT/DK96/00550, Dec. 20, 1996. This application Apr. 28, 1998, Appl. No. 67,556.

Claims priority, application Denmark, Dec. 20, 1995, 1447/95

Int. Cl.[7] **A21D** *2/00*

U.S. Cl. 426—18 **12 Claims**

1. A method of preparing a dough or a baked product prepared from the dough, comprising adding a pyranose oxidase enzyme to the dough ingredient or any mixture of the dough ingredients.

6,039,984

METHOD FOR TREATING A FOOD PROCESSING FACILITY

Rod A. Bowling, Rogers, Ark., and Robert Paul Clayton, Ft. Collins, Colo., assignors to Monfort, Inc., Greeley, Colo.

Continuation of application No. 08/751,912, Nov. 18, 1996, Pat. No. 5,869,113, which is a continuation-in-part of application No. 08/315,231, Sep. 29, 1994, Pat. No. 5,576,035, which is a continuation-in-part of application No. 07/796,052, Nov. 20, 1991, Pat. No. 5,374,433. This application Nov. 13, 1998, Appl. No. 191,333.

Int. Cl.[7] **A23C** *9/12;* **A61L** *2/00*

U.S. Cl. 426—61 **21 Claims**

1. A method for treating a food processing facility, comprising inoculating a food processing facility with an amount of non-spoilage and non-pathogenic bacteria to competitively inhibit the growth of pathogenic and spoilage bacteria.

6,039,985

REFRIGERATION-SHELF-STABLE ULTRA-PASTEURIZED OR PASTEURIZED INFANT FORMULA

A. Reza Kamarei, Princeton, N.J., assignor to Princeton Nutrition, L.L.C., Princeton, N.Y.

Continuation-in-part of application No. 08/975,692, Nov. 21, 1997, Pat. No. 5,985,339, Provisional application No. 60/031,637, Nov. 22, 1996. This application May 4, 1999, Appl. No. 305,071.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A23L** *1/304;* **A23C** *9/00*

U.S. Cl. 426—72 **34 Claims**

1. A refrigeration-shelf-stable infant formula being thermally treated under conditions of pasteurization or ultra-pasteurization having a nutritional composition comprising per five fluid ounces:

a. from about 1.8 to about 6.3 grams of protein;

b. from about 3.3 to about 15.9 grams of fat;

c. from about 300 mg to about 3000 mg of linoleic acid;

d. from about 250 to about 900 IU of Vitamin A;

e. from about 40 to about 180 IU of Vitamin D;

f. from about 0.7 to about 9 IU of Vitamin E;

g. from about 4 to about 24 mcg of Vitamin K;

h. from about 40 to about 300 mcg of Thiamine or Vitamin B 1;

i. from about 60 to about 450 mcg of Riboflavin or Vitamin B2;

j. from about 35 to about 180 mcg of Vitamin B6;

k. from about 0.15 to about 0.9 mcg of Vitamin B12;

l. from about 250 to about 3150 mcg of Niacin;

m. from about 4 to about 48 mcg of Folic Acid or Folacin;

n. from about 300 to about 1500 mcg of Pantothenic Acid;

o. from about 1.5 to about 13.2 mcg of Biotin;

p. from about 8 to about 36 mg of Vitamin C or Ascorbic Acid;

q. from about 7 to about 48 mg of Choline;

r. from about 4 to about 18 mg of Inositol;

S. from about 60 to about 234 mg of Calcium;

t. from about 30 to about 159 mg of Phosphorus;

u. from about 6 to about 24 mg of Magnesium;

v. from about 0.15 to about 5.4 mg of Iron;

w. from about 0.5 to about 3 mg of Zinc;

x. from about 5 to about 45 mcg of Manganese;
y. from about 60 to about 270 mcg of Copper;
z. from about 5 to about 75 mcg of Iodine;
aa. from about 20 to about 81 mg of Sodium;
bb. from about 80 to about 324 mg of Potassium; and
cc. from about 55 to about 195 mg of Chloride;
wherein the total caloric content is from about 80 kilocalories to about 300 kilocalories per five fluid ounces.

6,039,986

FORTIFICATION OF FOODSTUFF

Chandrasekhar R Mallangi, New Milford, Conn.; Alexander A. Sher, Rockville, Md.; Eileen Carol Fuchs, Gaylordsville, Conn.; Dharam Vir Vadehra, New Milford, Conn., and Elaine Regina Wedral, Sherman, Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed Jul. 10, 1998, Appl. No. 113,401
Int. Cl.[7] A23L *1/304*
U.S. Cl. 426—74 **17 Claims**

1. A fortified foodstuff containing a fortifying amount of a calcium complex consisting essentially of a balanced blend of calcium lactate and calcium carbonate which blend is stabilized with a source of glucuronic acid, wherein the foodstuff does not exhibit sedimentation of the complex for at least 10 weeks.

6,039,987

PHYSICAL ENDURANCE DRINK AND METHOD OF PREVENTING CRAMPING CAUSED BY STRENUOUS BODILY ACTIVITY

Robert Charles Strahl, 11170 Wood Elves Way, Columbia, Md. 21044

Continuation-in-part of application No. 09/007,095, Jan. 14, 1998, Pat. No. 5,891,888. This application Mar. 29, 1999, Appl. No. 281,129.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A23L *1/304*
U.S. Cl. 426—74 **6 Claims**

1. The beverage drink comprising the following ingredients and in substantially in the following ranges:
Glucose: 3–7%
Fructose: 3–7% (Total glucose plus fructose: 6–14%)
Sodium chloride 0.06–0.2%
Potassium chloride: 0.03–0.04%
Citric acid: 0.13–2.5% (sufficient to obtain a pH of 2.5–4.5)
Sodium or potassium monophosphate: 0.01–0.4%
Fruit flavor 0.04–1.0%
Sodium or potassium benzoate: 0.025–0.05 ppm
Quinine hydrochloride dihydrate: quinine 5 to 20 mgm/8 ounces
Sodium citrate: 0.01–0.4%
Water to make 100%
Carbon dioxide: 1–5 volumes.

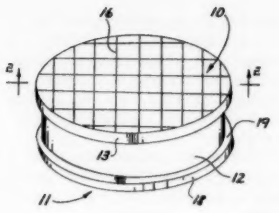
6,039,988

LAMINATED BAKED PRODUCT AND METHOD OF MAKING THE SAME

Woodrow C. Monte, 7634 W. Overfield Dr., Casa Grande, Ariz. 85222

Continuation-in-part of application No. 08/595,035, Jan. 31, 1996, Pat. No. 5,789,008. This application Aug. 4, 1998, Appl. No. 129,476.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A21D *13/00*
U.S. Cl. 426—94 **18 Claims**

1. A food product comprising
(a) at least one baked member having at least one outer surface;
(b) a layer of edible oil on said outer surface;



(c) a protein-containing layer covering said layer of edible oil, comprising an edible food, said layer of edible oil being partially adsorbed by said protein-containing layer.

6,039,989

PREPACKAGED THERAPEUTIC MEAL FOR TREATMENT OF DIET-RESPONSIVE CONDITIONS

William E. Bangs, Philadelphia, Pa.; Joseph D. Dibenedetto, Roebling, N.J.; Joyce L. Friedberg, Robbinsville, N.J.; Denise A. Giordano, Jackson, N.J.; Judy M. Glover, Marlton, N.J.; Chor San Heng Khoo, Mt. Laurel, N.J.; Sandy Ko, Abington; R. David C. MacNair, King of Prussia, both of Pa.; Scott R. Noar, Cherry Hill; John J. Randazzi, Jr., Sicklerville, both of N.J.; Harro Stoever, Greenwich, Conn., and Paula J. Ziegler, Cherry Hill, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Jun. 6, 1995, Appl. No. 470,361
Int. Cl.[7] B65D *85/00;* **A23L** *1/30;* **G01N** *33/02*
U.S. Cl. 426—106 **51 Claims**

1. A prepackaged therapeutic meal of a daily diet for consumption by a patient having at least one diet-responsive condition, said meal comprising;
at least one meal component, wherein said at least one meal component is nutritionally enhanced to contain a predetermined level of nutritional enhancement to facilitate management of said at least one diet-responsive condition, such that said meal comprises:
(a) dietary fiber in a range of about 5 grams to about 11 grams;
(b) vitamins and minerals in a range of about 30 to about 35 percent of USRDA, including potassium in a range of about 630 mg to about 1430 mg and sodium in a range of about 370 mg to about 950 mg,
(c) protein and fat, and protein supplies a range of about 14% to about 31% of a calorie content of said meal and fat supplies a range of about 10% to about 24% of said calorie content of said meal; and
(d) simple sugars in a range of about 6 grams to about 35 grams;
wherein a daily diet comprising at least one of said prepackaged thereutic meal, and said diet includes dietary fiber in a range of about 20 to 30 grams and at least about 50 percent of USRDA of vitamins and mineral, including potassium in a range of about 3000 mg to about 3500 mg, and sodium in an amount less than about 2400 mg;
wherein said daily diet supplies the patient with a desired total daily calorie content and in which protein provides about 15% to about 20% of said desired total daily calorie content and fat provides about 20% to about 30% of said desired total daily calorie content; and
wherein said daily diet comprises simple sugars in an amount leas than about 96 grams.

6,039,990

VACUUM PROCESSED FISH PRODUCT IN A TOMATO BASE COOKING SAUCE

Saloman Friedman, and Chava Friedman, both of 12 Israel Zupnick Dr. Unit 201, Monroe, N.Y. 10950

Filed Jul. 21, 1998, Appl. No. 119,903

Int. Cl.[7] A21D *10/02;* **B65D** *85/08*

U.S. Cl. 426—129 **16 Claims**

1. A vacuum-packed fish product provided in a tomato base cooking sauce processed at high temperature and comprising, by weight percent:

fish 43% to 53%;
egg 11% to 13%;
onion 8.5% to 10.5%;
oil 5.5% to 6.5%;
matzo meal 4.5% to 6.5%;
sugar 7.0 to 8.0%;
water 8.0% to 10.0%;
salt 1.0% to 2.0%;
potato starch 0.30% to 0.50%; and
white pepper 0.10% to 0.15%.

6,039,991

METHOD AND APPARATUS FOR SANITIZING MINCED MEAT

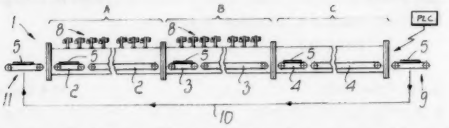
Giuseppe Ruozi, 42100 Reggio Emilia, Viale Timavo, 17, Italy

Filed Dec. 3, 1998, Appl. No. 205,117

Claims priority, application Italy, Jul. 1, 1998, MO98A0144

Int. Cl.[7] A21D *6/00;* **H05B** *6/80*

U.S. Cl. 426—241 **20 Claims**



1. A method for sanitizing raw minced meat, comprising the steps of:

quickly heating the minced meat by microwave heating and hot air under a pressure increasing from atmospheric pressure to an overpressure which prevents liquid evaporation;

further heating the minced meat by microwave heating up to a sterilization temperature and under constant overpressure for preventing liquid evaporation; and

cooling the minced meat under a gradually decreasing pressure;

wherein the sterilization temperature is below a threshold temperature at which the meat changes organoleptic characteristics with respect to the raw meat state thereof.

6,039,992

METHOD FOR THE BROAD SPECTRUM PREVENTION AND REMOVAL OF MICROBIAL CONTAMINATION OF FOOD PRODUCTS BY QUATERNARY AMMONIUM COMPOUNDS

Cesar Compadre; Philip Breen; Hamid Salari; E. Kim Fifer, all of Little Rock, Ark.; Danny L. Lattin, Brookings, S. Dak.; Michael Slavik, Springdale, Ark.; Yanbin Li, Fatettville, Ark., and Timothy O'Brien, Little Rock, Ark., assignors to University of Arkansas, Little Rock, Ark.

Continuation-in-part of application No. 08/631,578, Apr. 12, 1996, Pat. No. 5,855,940. This application Apr. 14, 1997, Appl. No. 840,288.

This patent is subject to a terminal disclaimer.

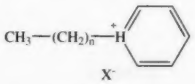
Int. Cl.[7] A01N *43/40*

U.S. Cl. 426—332 **26 Claims**

1. A method for preventing the growth of microorganisms other than Salmonella on meat products other than poultry comprising:

contacting said meat product other than poultry with a microbial growth inhibiting effective amount of a quaternary ammonium compound for about 20 seconds to about less than 10 minutes to prevent the growth of microorganisms other than Salmonella on said meat product, wherein said quaternary ammonium compound is selected from the group consisting of an alkylpyridinium salt represented by the structural formula (I):

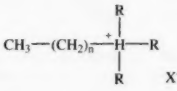
(I)



wherein n is 9–21, and X is a halide;

a tetra-alkylammonium salt represented by the structural formula (II):

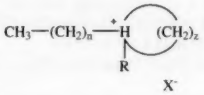
(II)



wherein n is 9–21, and R is selected from the group consisting of CH_3 and C_2H_5, and X is a halide; and

an alkylalicyclic ammonium salt represent by the structural formula (III):

(III)



wherein n is 9–21, Z is 4–5, R is selected from the group consisting of CH_3 and C_2H_5, and X is a halide.

6,039,993

DEVICE AND METHOD FOR FORMING A STRAND OF DOUGH

Cornelis Carinus Vrouwenvelder, 's-Hertogenbosch, Netherlands, assignor to Kaak, Johan Hendrik Bernard, Gaanderen, Netherlands

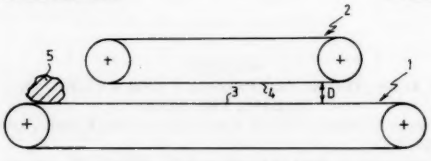
PCT No. PCT/NL96/00232, § 371 Date Mar. 18, 1998, § 102(e) Date Mar. 18, 1998, PCT Pub. No. WO97/00615, PCT Pub. Date Jan. 9, 1997

PCT Filed Jun. 11, 1996, Appl. No. 981,390

Claims priority, application Netherlands, Jun. 22, 1995, 1000637

Int. Cl.[7] A21C *3/00;* **A21D** *6/00*

U.S. Cl. 426—496 **3 Claims**



2. Method for forming a relatively short piece of dough into a strand of dough, comprising the step of providing a first conveyor belt having a first dough contact face and a second conveyor belt having a second dough contact face, the dough contact faces being at a spacing from each other in order to define a transforming space for the piece of dough, the step of placing the piece of dough on the first dough contact face of the first conveyor belt at rest and in the transforming space, the step of subsequently driving the first

conveyor belt while the second conveyor belt is at rest, and the step of driving the second conveyor belt while the first conveyor belt is at rest, in which the first conveyor belt is driven exclusively in one direction and the second conveyor belt is driven exclusively in one direction, whereby the resulting dough strand is stress-free and can maintain a straight shape.

6,039,994

READY-TO-BAKE SHELF-STABLE CAKE DOUGH AND PROCESS FOR ITS MANUFACTURE

René LeFlécher, Versailles, France, and Peter Robson, North Yorkshire, United Kingdom, assignors to Bestfoods, Englewood Cliffs, N.J.

Filed Mar. 19, 1998, Appl. No. 44,449

Claims priority, application European Pat. Off., Apr. 4, 1997, 97105619

Int. Cl.[7] **A21D** *8/00*

U.S. Cl. 426—498 **12 Claims**

1. A process for manufacturing a ready-to-bake, shelf-stable cake dough consisting essentially of flour, sugar, fat, eggs and water comprising the steps of

a) making a premix powder by homogeneously mixing an enzyme-inactivated flour, and sugar;

b) making an emulsion by placing into a mixer the fat and pressurizing with an inert gas, whereafter a vacuum is applied and a liquid mix of pasteurized whole eggs and water is sucked into the mixer in which the fat and the liquid mix are intensively mixed under vacuum to create the emulsion and remove the oxygen, whereafter the vacuum is broken with inert gas;

c) adding the premix powder to the emulsion and mixing under vacuum to make a dough;

d) reducing the oxygen content of the dough by injection of inert gas followed by vacuum during mixing;

e) breaking the vacuum with an inert gas which is at least partly soluble in the dough and pressurizing the dough with said gas up to 1–2 bar (0.1–0.2 MPa) and mixing under this atmosphere for another 20–30 minutes; and

f) packing the dough in an essentially gas-impermeable pouch which is flushed with inert gas before it is sealed.

6,039,995

METHOD OF MAKING PARTIALLY SPLIT SLICES OF BACON

Merle Zamzow, Loganville, Ga., assignor to Hormel Foods, LLC, Austin, Minn.

Filed May 29, 1998, Appl. No. 87,316

Int. Cl.[7] **A23P** *1/00*

U.S. Cl. 426—518 **13 Claims**

1. A method of making a partially split slice of bacon, comprising:

a) partially splitting a belly by making a cut, which extends from the belly's flank end to the belly's shoulder end, on the belly's first side, the cut extending from the first side to proximate the belly's second side, wherein the belly is partially split; and

b) slicing the belly to form a slice of bacon that is partially split, wherein the slice of bacon may be later easily split into two pieces.

6,039,996

ACID-NEUTRALIZING ADDITIVE FOR ROASTING COFFEE

Richard S. Hornack, Overland Park, Kans., assignor to Chemcraft, Inc., Overland, Kans.

Provisional application No. 60/044,389, Apr. 18, 1997. This application Apr. 17, 1998, Appl. No. 62,270.

Int. Cl.[7] **A23L** *1/22;* **A23B** *6/00;4/03;* **A23F** *5/00*

U.S. Cl. 426—534 **2 Claims**

1. A process for reducing acidity in beans comprising contacting the beans with a solution comprising from about 1 to 2 percent Phosphorus Pentoxide, from about 0.25 to about 2 percent non-anionic surfactant, about five to about 40 percent of a solution of about 45 percent potassium hydroxide, and from about 55 to about 80 percent deionized water.

6,039,997

BREAD AND BREAD'S DOUGH

Naoyuki Mizoguchi, Nagoya; Katsuyuki Yamamoto, Itami, and Kimihito Wada, Nishinomiya, all of Japan, assignors to Matsutani Chemical Industries Co., Ltd., Hyogo-ken, Japan

Filed Apr. 8, 1997, Appl. No. 835,481

Claims priority, application Japan, Apr. 9, 1996, 8-112024

Int. Cl.[7] **A21D** *10/00*

U.S. Cl. 426—549 **4 Claims**

1. A dough for a bread which is obtainable by adding 65 to 90 parts by weight of water per 100 parts by weight of a raw powder, and kneading the mixture, wherein said raw powder comprises 50 to 90 parts by weight of wheat flour and 50 to 10 parts by weight of starches including at least 4 parts by weight of a cold water swelling starch having a hot water solubility of not more than 8% by weight, a ratio of a cold water swelling power (Sc) to a hot water swelling power (Sh), Sc/Sh, ranging from 1.2 to 0.8 and a cold water swelling power ranging from 4 to 15; said raw powder additionally comprises a cross-linked starch that is different from the cold water swelling starch, said cross-linked starch having a hot water swelling power ranging from 3 to 15 and a hot water solubility of 15% or less by weight and comprises 6.5 to 9.0% by weight of protein derived from wheat flour.

6,039,998

FREEZABLE LOW-CALORIE SPOONABLE DRESSING AND METHOD FOR THEIR PRODUCTION

Bernard Charles Sekula, Lebanon Township, N.J., and Rosemary Antoinette Golden, New York City, N.Y., assignors to Bestfoods, Englewood Cliffs, N.J.

Filed Mar. 4, 1999, Appl. No. 262,221

Int. Cl.[7] **A23D** *9/007*

U.S. Cl. 426—605 **17 Claims**

1. A spoonable dressing composition having a fat component comprising at least about 25 weight percent fatty acid-esterified propoxylated glycerin having an average of about 3 to about 16 oxypropylene units per unit of glycerin and the fatty acid of the fatty acid esterified propoxylated glycerine is at least about 75% by weight stearic acid with the balance of the fat component comprising blended salad oil which composition exhibits freeze-thaw stability.

6,039,999

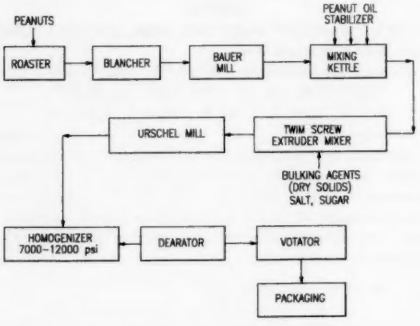
REDUCED FAT NUT BUTTER PRODUCT AND PROCESS FOR MAKING THE SAME

Amarjit S. Bakshi, Yorba Linda, and Lakho L. Khatri, Walnut, both of Calif., assignors to Hunt Wesson, Inc., Fullerton, Calif.

Continuation of application No. 08/105,005, Aug. 11, 1993, abandoned. This application Jan. 30, 1995, Appl. No. 380,255.

Int. Cl.[7] **A23L** *1/38*

U.S. Cl. 426—633 **28 Claims**



1. A method for making a reduced fat nut butter product comprising the steps of:

(a) combining

from about 30% to about 75% of a nut paste,

from about 15% to about 45% of one or more water-soluble, non-fat dry solid,

from about 0% to about 10% of an added edible oil,

from about 0% to about 30% of at least one water-insoluble non-fat dry solid, from about 0% to about 3% stabilizer; and

from about 0% to about 3% emulsifier, where the percentages are weight percentages based on the total weight of the nut butter product;

(b) intimately mixing the combination by passing it through an extruder mixer simultaneously with the generation of free nut oil; and then

(c) homogenizing the mixture under a pressure of at least about 4,000 psig.

6,040,000

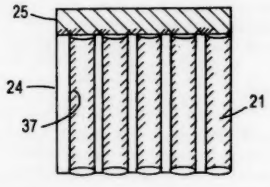
METHOD AND APPARATUS FOR A MICROCHANNEL PLATE HAVING A FISSURED COATING

Richard F. Floryan, Roanoke, and George Hambro, Blue Ridge, both of Va., assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Mar. 24, 1998, Appl. No. 47,167

Int. Cl.[7] **C23C** *14/24*

U.S. Cl. 427—78 **10 Claims**



1. A method for making an improved microchannel plate, comprising:

providing a microchannel plate being of a type formed from a substrate having an input surface, and output surface, and a plurality of channels extending therebetween for providing secondary emmission of electrons incident to said channels;

forming an insulative film over the input surface and the channels of the microchannel plate;

after forming the insulative film, depositing a fissured material onto the input surface of the microchannel plate, said fissured material having random fissures and being capable of secondary electron emission on the input surface of the microchannel plate and of causing a cascade of electrons for entry into said channels of the microchannel plate in response to an electron entering one of said fissures; and

after depositing the fissured material, removing the insulative film, whereby said fissured material does not penetrate into the channels.

6,040,001

METHOD OF MANUFACTURING A DIAMOND VACUUM DEVICE

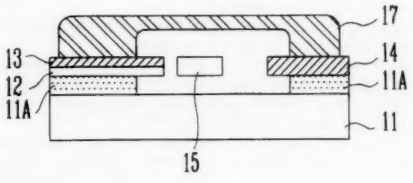
Mun Cheol Paek; Sung Woo Choi, and Kee Soo Nam, all of Daejon-Shi, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Aug. 20, 1998, Appl. No. 136,614

Claims priority, application Rep. of Korea, Sep. 18, 1997, 97-47535

Int. Cl.[7] **B05D** *5/12*; **C23C** *16/00*

U.S. Cl. 427—78 **3 Claims**



1. A method of manufacturing a diamond vacuum device, comprising the steps of:

after forming a silicon oxide film on a silicon substrate through an oxidation process, depositing a polysilicon wiring layer thereon and patterning said polysilicon wiring layer into an anode shape;

depositing a diamond thin film on said polysilicon wiring layer through a selective deposition method to form a diamond cathode;

depositing a refractory metal thin film on said silicon oxide film and then patterning said refractory metal thin film to form gates and anode, wherein said gates are formed at right and left sides of the electron emission direction of said diamond cathode, and said anode is formed at the electron emission direction of said diamond cathode;

forming a photosensitive pattern on the outside of the entire structure after forming said gates and anode and etching the exposed silicon oxide film therein, wherein said etching is performed up to a silicon oxide film below said diamond cathode, said gate and said anode, thus floating said diamond cathode, said gate and the anode in a space;

removing said photosensitive pattern, and filling a photosensitive film within said space by an inverse mask pattern;

depositing a silicon oxide film on the entire structure including said photosensitive film filled within said space to package in vacuum, wherein an outlet is formed at a portion of said anode; and

removing said photosensitive film filled within said space through said outlet and sealing in vacuum said outlet using a silicon oxide film.

6,040,002

ETCHING RESIST COMPOSITION, PATTERN FORMING METHOD MAKING USE OF THE SAME, PRINTED-WIRING BOARD AND ITS PRODUCTION

Hiromichi Noguchi, Atsugi; Hiroshi Sugitani, Machida; Yutaka Koizumi, Yokohama; Tadayoshi Inamoto, Hachioji; Kiyomi Aono, Kokubunjii, and Yoshie Nakata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 08/353,694, Dec. 12, 1994, abandoned. This application Feb. 18, 1997, Appl. No. 801,419.

Claims priority, application Japan, Dec. 14, 1993, 5-313612

Int. Cl.[7] **B05D** *5/12;* **H05K** *3/06*

U.S. Cl. 427—96 **34 Claims**

1. A process for producing a printed-wiring board, comprising steps:

i) patternwise imparting an etching resist aqueous composition to a surface of a copper-foil laminated substrate by ink-jet printing, said etching resist aqueous composition having a viscosity of 10 cP or below and comprising a base, water, and a polymeric compound which is neutralized by said base to form a compound soluble in water and said aqueous composition;

ii) drying the etching resist aqueous composition imparted to the surface of the copper-foil laminated substrate; and

iii) etching the copper-foil which is not covered with the dried etching resist aqueous composition.

6,040,003

METHOD AND APPARATUS FOR LUBRICATING CONTINUOUS FIBER STRAND WINDING APPARATUS

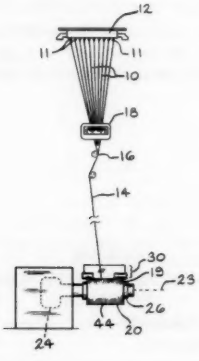
Roy E. Smith, Columbus, Ohio, assignor to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation of application No. 08/683,014, Jul. 16, 1996, Pat. No. 5,756,149. This application Mar. 5, 1998, Appl. No. 35,714.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B05D** *3/12*

U.S. Cl. 427—177 **5 Claims**



1. A method for winding a mineral fiber strand to build a package comprising the steps of:

providing a moving strand;

applying a size to the strand;

attaching the strand to a collet;

rotating the collet to wind the strand and build a package of the strand;

reciprocating the strand with a strand reciprocator to lay the strand in a pattern on a package surface as the package rotates during building;

generating a fog of airborne lubrication particles from a lubricant; and

lubricating the strand reciprocator by transferring a portion of the fog of airborne lubrication particles to the strand reciprocator, wherein the lubricant is one of a self-emulsifying lubricant, an organic, agriculturally based lubricant, a bisimid, and a reaction product of polyethyleneimine polyamide salt and water.

6,040,004

METHOD AND APPARATUS FOR FABRICATING A PARTICLE-COATED SUBSTRATE, AND SUCH SUBSTRATE

Kenji Matsumoto, Kawasaki; Kazuo Suzuki, and Muneo Haga, both of Sagamihara, all of Japan, assignors to 3M Innovative Properties Company, St. Paul, Minn.

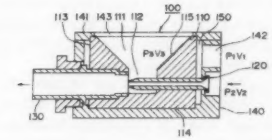
PCT No. PCT/US96/03091, § 371 Date Aug. 1, 1997, § 102(e) Date Aug. 1, 1997, PCT Pub. No. WO96/28256, PCT Pub. Date Sep. 19, 1996

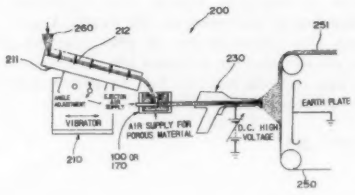
PCT Filed Mar. 8, 1996, Appl. No. 875,713

Claims priority, application Japan, Mar. 9, 1995, 7-049603

Int. Cl.[7] **B05D** *7/00*

U.S. Cl. 427—185 **3 Claims**





1. An ejector for ejecting particles to be coated onto a substrate, comprising:

a storage container made of a porous material, the container including an interior adapted for storing particles in the container and an outer surface;

an ejection as nozzle extending from outside the container to the interior and provided at a bottom portion of the storage container, in a portion thereof where the particles are stored, adapted for feeding to the interior of the storage container an ejection gas to be ejected to outside of the storage container;

a discharge tube arranged generally coaxially of the ejection gas nozzle at the bottom portion of the storage container and extending from the interior of the container to outside the container, and adapted for sending the ejection gas and the particles from the interior to outside of the storage container;

an agitation gas inlet in fluid communication with the outer surface of the porous storage container adapted for feeding an agitation gas from the outside of the storage container through the porous container to the interior of the storage container to perform agitation for imparting a fluidized state to the particles present at least at the bottom portion of the storage container interior where the ejection gas nozzle and the discharge tube are disposed; and

an outer container forming a gas-pressure buffer portion defined by a clearance between the outer container and the outer surface of the storage container where the ejection gas nozzle and the discharge tube are disposed, wherein the agitation as inlet is in fluid communication with the buffer portion and wherein the gas-pressure buffer portion is formed so as to surround the storage container.

6,040,005

COLORED POLYMERS

Kathyrn Carr, Preston, and Ian Ferguson, Lancashire, both of United Kingdom, assignors to Zeneca Limited, London, United Kingdom

PCT No. PCT/GB96/01776, § 371 Date Feb. 12, 1998, § 102(e) Date Feb. 12, 1998, PCT Pub. No. WO97/07169, PCT Pub. Date Feb. 27, 1997

PCT Filed Jul. 24, 1996, Appl. No. 11,611

Claims priority, application United Kingdom, Aug. 12, 1995, 9516575

Int. Cl.[7] B05D *1/00*

U.S. Cl. 427—197 **13 Claims**

1. A colour filter or reprographic toner which comprises a coloured polymer corresponding to the polymer obtained by polymerisation of a mixture comprising a dye and a triazine compound having at least two groups selected from the class consisting of alkoxymethylamino and hydroxymethylamino.

6,040,006

APPARATUS AND METHOD FOR APPLYING COATING MATERIALS TO INDIVIDUAL SHEET MEMBERS

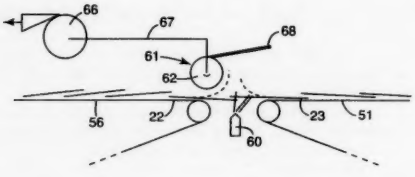
Frédéric Pierre Alain Le Riche, Osny, and Bernard Raymond Pierre, Monneville, both of France, assignors to 3M Innovative Properties Company, St. Paul, Minn.

Division of application No. 08/949,994, Oct. 14, 1997, Pat. No. 5,868,838, which is a division of application No. 08/675,857, Jul. 5, 1996, abandoned, which is a continuation-in-part of application No. 08/291,610, Aug. 17, 1994, abandoned, and application No. 08/615,587, Mar. 12, 1996, abandoned, which is a continuation of application No. 08/291,628, Aug. 17, 1994, abandoned. This application Jan. 14, 1999, Appl. No. 231,031.

Claims priority, application United Kingdom, Feb. 16, 1996, 9603281; Feb. 16, 1996, 9603345; Feb. 16, 1996, 9603355; Feb. 16, 1996, 9603365; Feb. 16, 1996, 9603366

Int. Cl.[7] B05D *1/28*

U.S. Cl. 427—209 **1 Claim**



1. A method of coating sheets comprising the steps of:

(a) sequentially conveying a plurality of sheets, each having first and second major surfaces, along a sheet path;

(b) applying an aqueous coating material to the first and second major surfaces of each individual sheet as the sheets are conveyed along the sheet path so as to form coated sheets;

(c) arranging the coated sheets with a trailing edge portion of each sheet underneath a leading edge portion of a succeeding sheet; and

(d) changing the relative overlapping positions of the sheets by (i) lifting the overlapped edge portions of each sheet away from the sheet path, (ii) retarding return of the lifted trailing edge portion of each sheet for a time period sufficient to allow the lifted leading edge portion of the succeeding sheet to return to the sheet path before the trailing edge portion, and then (iii) allowing the lifted trailing edge portion of the sheet to return to the paper path and rest on top of the leading edge portion of the succeeding sheet.

6,040,007

NICKEL HYDROXIDE PARTICLES HAVING AN α- OR β-COBALT HYDROXIDE COATING LAYER FOR USE IN ALKALI BATTERIES AND A PROCESS FOR PRODUCING THE NICKEL HYDROXIDE

Imaizumi Junichi; Kawasaki Yuri; Makino Tetsushi, and Iida Toyoshi, all of Fukui-ken, Japan, assignors to Tanaka Chemical Corporation, Fukui, Japan

Filed May 19, 1997, Appl. No. 858,599

Claims priority, application Japan, Jun. 19, 1996, 8-178522; Jun. 19, 1996, 8-178523

Int. Cl.[7] B05D *7/00*

U.S. Cl. 427—215 **2 Claims**

1. A process for producing an active material for positive electrodes of alkali batteries, comprising the following steps:

(1) supplying an aqueous solution of a nickel salt, an ammonium ion source and a solution of an alkali metal hydroxide into a reaction vessel;

(2) causing a continuous crystal growth of high-density nickel hydroxide;

(3) recovering the resultant nickel hydroxide particles and supplying them into another reaction vessel;

(4) adding an ammonium ion source and a solution of an alkali metal hydroxide and adjusting the pH to 8–11; and

(5) adding an aqueous solution of a cobalt salt and a solution of an alkali metal hydroxide while maintaining the pH value, thereby forming an α-cobalt hydroxide coating layer on the surface and within pores of said nickel hydroxide particles.

6,040,008

SILICON CARBIDE FIBERS WITH BORON NITRIDE COATINGS

Michael D. Sacks, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Provisional application No. 60/055,424, Aug. **4**, **1997**. This application May **21**, **1998**, Appl. No. **82,869**.

Int. Cl.[7] B05D 3/02;3/04

U.S. Cl. 427—226 **24** Claims

23. A process for producing a boron nitride coating on a boron-doped, refractory carbide body, comprising the steps of exposing the body to an atmosphere consisting primarily of nitrogen gas, and maintaining the body at a treatment temperature sufficient to develop a boron nitride coating on the body, where the tensile strength of said body having said boron nitride coating is approximately equal to the tensile strength of said body prior to production of said boron nitride coating.

6,040,009

LOW SOLVENT CONTENT TYPE-RESIN COMPOSITION, COATING COMPOSITION CONTAINING SUCH RESIN COMPOSITION AND PROCESS FOR COATING SUCH COATING COMPOSITION

Yoshiaki Marutani; Takashi Tomita; Tadamitsu Nakahama; Hiroyuki Uemura; Kazuhi Koga, and Mika Ohsawa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 19, 1995, Appl. No. 491,736

Claims priority, application Japan, Jun. 23, 1994, 6-141918; Jul. 6, 1994, 6-154714

Int. Cl.[7] C09B *167/00;167/04*

U.S. Cl. 427—241 **18 Claims**

1. A low organic solvent content resin composition comprising:

(1) a polyester oligomer, which is a star oligomer or a star burst oligomer prepared by an addition reaction, having a hydroxy group in an amount of 2.0 to 10.0 moles/Kg-resin, a number average molecular weight (Mn) of 300 to 1500, a weight average molecular weight (Mw) of 300 to 3000, and a ratio of a weight average molecular weight/a number average molecular weight (Mw/Mn) of 1.0 to 2.0, an amount of a modifying lactone being 31 to 85%, and an aliphatic hydrocarbon group having 4–22 carbon atoms derived from the group consisting of a monoepoxy compound, a hydroxy acid and an aliphatic acid;

said addition reaction being carried out such that:

(i) one mole of a polyol having 3 to 6 hydroxyl groups is reacted with 0.3 to 1.5 mole of an acid anhydride, then with 2 to 10 moles of a lactone, and then with 0.3 to 1.5 mole of a monoepoxy compound: or

(ii) one mole of a polyol having 3 to 6 hydroxyl grouns is reacted with 0.3 to 1.5 mole of an acid anhydride, then with 0.3 to 1.5 mole of a monoepoxy compound, and then with 2 to 10 moles of a lactone: or

(iii) one mole of a polyol having 3 to 6 hydroxyl groups is reacted with 2 to 10 moles of a lactone, then with 0.3 to 1.5 mole of an acid anhydride, and then with 0.3 to 1.5 mole of a monoepoxy compound, or

said addition reaction being carried out such that:

one mole of a polyepoxy compound having 3 to 6 epoxy groups is reacted with 2 to 6 moles of a hydroxy acid or an aliphatic acid, and then with 2 to 10 moles of a lactone;

(2) a curing agent reactive with a hydroxyl group of said polyester oligomer;

and wherein the content of an organic solvent is 5 to 40%.

6,040,010

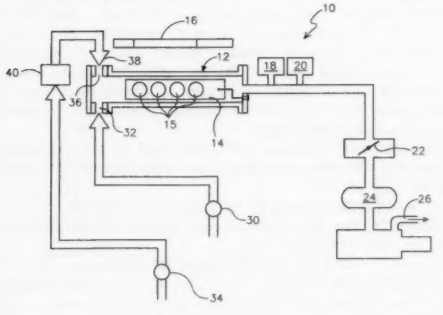
CATALYTIC BREAKDOWN OF REACTANT GASES IN CHEMICAL VAPOR DEPOSITION

Anand Srinivasan, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 10, 1996, Appl. No. 709,856

Int. Cl.[7] C23C *16/06;16/08*

U.S. Cl. 427—250 **16 Claims**



1. A method of depositing a film on a semiconductor wafer in a chemical vapor deposition process comprising the steps of:

a) providing a semiconductor wafer in a chamber;

b) providing a first gas to the chamber, the first gas passing through a first line, wherein the first gas comprises a refractory metal compound;

c) contacting an activated gas precursor with a catalyst to produce an activated gas;

d) delivering the activated gas into the chamber through a second line, wherein the second line is separate from the first line such that the first gas does not contact the catalyst; and

e) contacting the semiconductor wafer with the activated gas and the first gas, wherein a film comprising the refractory metal of the refractory metal compound is formed on the semiconductor.

6,040,011

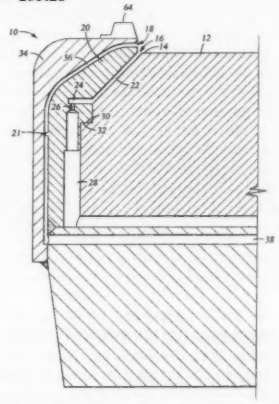
SUBSTRATE SUPPORT MEMBER WITH A PURGE GAS CHANNEL AND PUMPING SYSTEM

Joseph Yudovsky, and Moris Kori, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 24, 1998, Appl. No. 103,462

Int. Cl.[7] C23C *16/06;16/44*

U.S. Cl. 427—255.28 **38 Claims**



21. A method for depositing a coating on a substrate comprising:

positioning a substrate on a substrate receiving surface of a substrate support member;

flowing a process gas into the chamber and to the substrate;

flowing a purge gas through a purge gas inlet disposed at least partially around the edge of the substrate receiving surface;

exhausting the purge gas from the chamber through a pump channel formed in the substrate support member and having an outlet disposed adjacent to the edge of the substrate and above the purge gas inlet.

6,040,012

PROCESS FOR THE PREPARATION BY CHEMICAL VAPOR DEPOSITION (CVD) OF A TI-A1-N BASED MULTILAYER COATING

Stéphanie Anderbouhr, Grenoble; Frédéric Schuster, Lans en Veacors; Elisabeth Blanquet, Claix, and Gérald Theret, Grenoble, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France

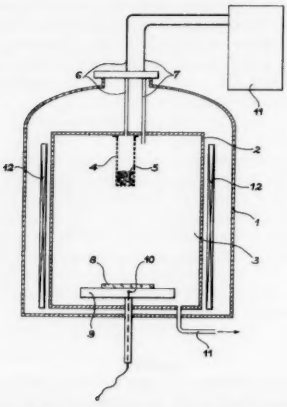
Filed Aug. 12, 1998, Appl. No. 132,992

Claims priority, application France, Aug. 29, 1997, 97 10801

Int. Cl.[7] C23C *16/34*

U.S. Cl. 427—255.391 **13 Claims**

1. A process for preparing a multilayer coating on a substrate comprising a stack of at least two different layers, each layer



selected from the group consisting of titanium nitride and aluminum titanium nitride, said process comprising continuously and in a single operation applying said multilayer coating on said substrate in an enclosure, wherein each layer of said multilayer coating is formed by chemical vapor deposition from a gaseous mixture comprising hydrogen, titanium chlorides, aluminum chlorides, and a reducing gas selected from the group consisting of nitrogen and ammonia, wherein said titanium chlorides and aluminum chlorides are obtained by chlorination of a single charge of titanium and aluminum alloy, and wherein the reducing gas to hydrogen molar ratio in the gaseous mixture is modified for each layer so that the amount of aluminum in each said layer of said multilayer coating is varied, thereby producing either said titanium nitride when no aluminum is provided in the layer by said modification of said reducing gas to hydrogen molar ratio or said aluminum titanium nitride when aluminum is provided in the layer by said modification of said reducing gas to hydrogen molar ratio.

6,040,013

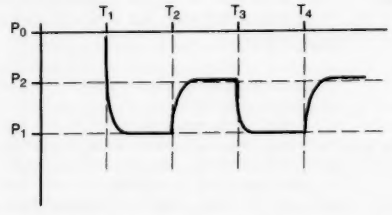
VACUUM TUMBLING OF MEATS AND OTHER FOODS

Stephen P. Karales, 2011 Riverside Dr., Suite 300, Columbus, Ohio 43221, assignor to Stephen P. Karales, Parma Heights, Ohio

Continuation of application No. 08/759,836, Dec. 2, 1996, abandoned, which is a continuation of application No. 08/605,683, Feb. 22, 1996, abandoned, which is a continuation of application No. 08/328,484, Oct. 25, 1994, abandoned. This application Nov. 21, 1997, Appl. No. 975,566.

Int. Cl.[7] **A23L** *1/31*

U.S. Cl. 427—281 **9 Claims**



1. A method for treating pieces of food by tumbling in a marinade, the method comprising:

(a) tumbling the pieces of food with a marinade in a gentle kneading action so the pieces simply roll over each other, said pieces being tumbled in a sealed tumbler having a smoothly continuous, surrounding interior longitudinal side wall having a central axis parallel to the longitudinal sidewall and having no protrusions contacting the pieces of food to avoid impacting the food against a solid surface, the tumbler being rotated about the axis of the side wall; and

(b) pumping gas from the tumbler to attain a reduced pressure at a first pressure value and then subsequently pumping gas from the tumbler during the tumbling to maintain a reduced, subatmospheric pressure during rotation until the pressure is returned to atmospheric pressure for removing the pieces of food from the tumbler;

wherein rotation is such as to avoid lifting the product higher than the axis of rotation and dropping the product while being rotated.

6,040,014

FABRIC TREATMENT COMPOSITION

Avedik Izmirlian, 110 E. 9th St., Suite C602, Los Angeles, Calif. 90079, and Attilio del Verme, 359 Lexington Ave., Clifton, N.J. 07011

Provisional application No. 60/063,023, Oct. 23, 1997. This application Oct. 21, 1998, Appl. No. 176,535.

Int. Cl.[7] **C09B** *67/00*

U.S. Cl. 427—358 **23 Claims**

1. A fabric treatment composition comprising:

a fatty acid ester;

a silicone elastomer; and

a polyacrylate thickening agent;

wherein the composition is used as a pre-treatment for the fabric prior to application of ink thereto to facilitate retention and resolution of the ink on the fabric.

6,040,015

PROCESS FOR FORMATION OF MULTILAYER FILM

Yasushi Nakao, Oobu, and Shigeru Nakamura, Owariasahi, both of Japan, assignors to Kansai Paint Co. Ltd., Hyogo-Ken, Japan

Filed May 14, 1998, Appl. No. 78,686

Claims priority, application Japan, May 15, 1997, 9-125112

Int. Cl.[7] **B05D** *1/36*

U.S. Cl. 427—407.1 **12 Claims**

1. A process for forming a multilayer film comprising applying to a substrate, in the following order:

(A) a liquid solid-color coating comprising at least one thermosetting resin composition and at least one metal powder coated with at least one coloring pigment, and

(B) a clear coating and heating the resulting substantially uncured coating films to crosslink and cure them simultaneously.

6,040,016

LIQUID APPLICATION NOZZLE, METHOD OF MANUFACTURING SAME, LIQUID APPLICATION METHOD, LIQUID APPLICATION DEVICE, AND METHOD OF MANUFACTURING CATHODE-RAY TUBE

Masato Mitani, Hirakata; Kazuto Nakajima, Yamatokoriyama; Hiroyuki Kotani, Izumi; Nobutaka Hokazono, Neyagawa; Hiroyuki Naka, Osaka; Akira Yamaguchi, Hirakata; Junji Ikeda, Ikoma, and Nobuyuki Aoki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., and Matsushita Electronics Corporation, both of Osaka, Japan

PCT No. PCT/JP97/00462, § 371 Date Oct. 20, 1997, § 102(e) Date Oct. 20, 1997, PCT Pub. No. WO97/30793, PCT Pub. Date Aug. 28, 1997

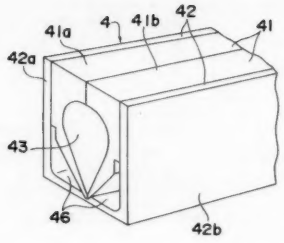
PCT Filed Feb. 20, 1997, Appl. No. 930,218

Claims priority, application Japan, Feb. 21, 1996, 8-033391; Oct. 14, 1996, 8-271104

Int. Cl.[7] **B05D** *1/02;* **B05B** *7/06*

U.S. Cl. 427—421 **21 Claims**

11. A method for coating an object, comprising:



discharging liquid in a linear or curtain-like shape and gas surrounding the liquid from a nozzle comprised of a first block having an inner liquid reserving section which extends in a longitudinal direction and an inner discharge section which is formed at a bottom portion of the inner liquid reserving section, which extends in the longitudinal direction, and which has formed therein a plurality of holes or a slit so as to form an outlet of the inner discharge section, and a second block having an inner gas reserving section which extends in the longitudinal direction and an outer discharge section which is formed at a bottom portion of the inner gas reserving section, which extends in the longitudinal direction, and which has formed therein a plurality of holes or a slit so as to form an outlet of the outer discharge section, wherein the first block is positioned in the second block such that the outlet of the inner discharge section is further from a position where the object is to be coated than a portion of the outlet of the outer discharge section nearest the inner discharge section; and

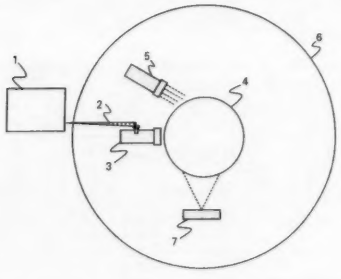
moving the object and the nozzle relative to each other while discharging the liquid and the gas.

6,040,017

FORMATION OF MULTILAYERED PHOTONIC POLYMER COMPOSITES

Michael G. Mikhael; Ali Boufelfel, and Angelo Yializis, all of Tucson, Ariz., assignors to Sigma Laboratories, Inc., Tucson, Ariz.

Filed Oct. 2, 1998, Appl. No. 165,999
Int. Cl.[7] C23C *16/48*
U.S. Cl. 427—496 **6 Claims**



1. A method for forming a sequential multilayered film polymer composite via a binary evaporator system from either a homogeneous solution or a heterogeneous slurry according to the following steps:

(a) evaporating from a first evaporator an electron acceptor dopant at sufficient temperatures and pressures to allow the evaporation;

(b) condensing the vapor of the dopant onto a temperature controlled substrate which is attached to a rotating drum to form a layer;

(c) flash-evaporating from a second evaporator a mixture of an electron donor organic substance and a radiation curable acrylate monomer at sufficient pressures and temperatures which allow the evaporation of each constituent;

(d) condensing said mixture vapor (step c) onto the previously deposited dopant (step b);

(e) curing the layer with a radiation source; and

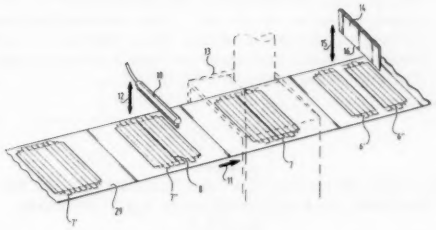
(f) repeating steps (a) through (e) until a desired number of layers is obtained.

6,040,018

METHOD FOR REINFORCING A BOARD, SHEET OR FOIL

Jacobus Stephanus Lamers, Bemmel, Netherlands, assignor to Lamers Beheer B.V., Gendt, Netherlands

Filed Dec. 4, 1997, Appl. No. 984,867
Int. Cl.[7] B05D *3/06;3/12*
U.S. Cl. 427—510 **18 Claims**



1. A method for reinforcing a board, sheet or foil of fibrous material, the method comprising the steps of:

(a) providing the board, the sheet or the foil of fibrous material as a preformed blank;

(b) providing a curable liquid;

(c) impregnating with the curable liquid a zone of the preformed blank, with the zone extending between opposite edges of the preformed blank;

(d) causing the curable liquid to cure such that a reinforced zone forms extending between the opposite edges of the preformed blank; and

(e) separating by a separating operation the reinforced zone into two complementary edges such that the preformed blank is divided into two substantially identical parts, and

wherein step (e) of the method occurs after step (c) of the method.

6,040,019

METHOD OF SELECTIVELY ANNEALING DAMAGED DOPED REGIONS

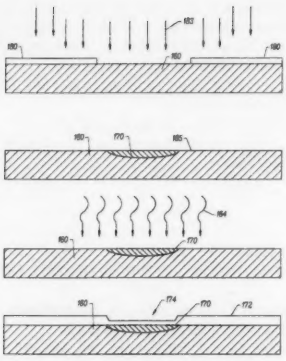
Emi Ishida, Sunnyvale; Xiao-Yu Li, and Sunil D. Mehta, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 14, 1997, Appl. No. 799,230
This patent is subject to a terminal disclaimer.
Int. Cl.[7] C23C *14/00;* **H01L** *21/263;* **B05D** *3/06*
U.S. Cl. 427—526 **23 Claims**

1. A method of forming a region of impurity in a semiconductor wafer substrate having a surface, comprising sequential steps of:

(a) imparting a surface oxidation-inhibiting impurity into the semiconductor substrate to a depth below the surface of the semiconductor substrate to form a surface oxidation-inhibiting impurity region;

(b) applying a first laser energy to the semiconductor substrate at a sufficient magnitude to liquify the semiconductor substrate in the surface oxidation-inhibiting impurity regions to repair the surface of the semiconductor substrate damaged by the step (a); and



(c) growing an oxide region on the surface of the semiconductor substrate such that the oxide region grows at a first rate over the surface oxidation-inhibiting impurity region and a second rate on the surface not over the surface oxidation-inhibiting impurity region, wherein the first rate is different from the second rate and the oxide region produced by the first rate has a thickness measuring up to about 100 Å.

6,040,020

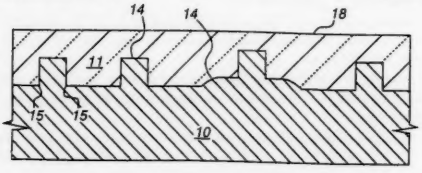
METHOD OF FORMING A FILM HAVING ENHANCED REFLOW CHARACTERISTICS AT LOW THERMAL BUDGET

Gurtej Sandhu, and Randhir P. S. Thakur, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 7, 1995, Appl. No. 512,234

Int. Cl.[7] B32B *17/00*

U.S. Cl. 427—557 **10 Claims**



1. A method of forming a film, comprising the steps of:

forming a surface layer of material lying above a base layer of material, the surface layer having a lower melting point than the base layer, wherein the step of forming the surface layer comprises the step implanting a top portion of the base layer with a dopant;

exposing said surface layer and said base layer to radiant energy so as to cause reflow of said surface layer and said base layer, removing said surface layer subsequent said reflow.

6,040,021

PLASMA CVD PROCESS FOR METAL FILMS AND METAL NITRIDE FILMS

Takaaki Miyamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

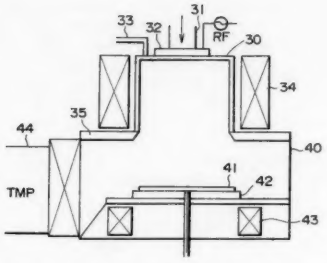
Filed Dec. 19, 1997, Appl. No. 994,993

Claims priority, application Japan, Dec. 24, 1996, P08-343678; Jun. 25, 1997, P09-169027

Int. Cl.[7] B05D *3/06;* **C23C** *16/00*

U.S. Cl. 427—576 **28 Claims**

1. A plasma CVD process for forming a metal film on a substrate to be processed using a source gas containing a metal halide gas, hydrogen gas, and a noble gas, said process comprising the steps of:



reducing the metal halide by activated hydrogen species in a plasma to generate neutral species of a metal;

making the neutral species of the metal collide with at least one kind of activated species of the noble gas and electrons in the plasma to generate metal ions;

making the metal halide collide with at least one kind of the activated species of the noble gas and the electrons in the plasma to generate metal ions and neutral species of a halogen;

reducing the neutral species of the halogen by the activated hydrogen species in the plasma to generate a hydrogen halide; and

making the metal ions thus generated incident on a principal surface of the substrate to be processed in the direction substantially perpendicular to the principal surface.

6,040,022

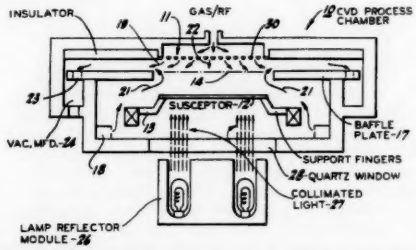
PECVD OF COMPOUNDS OF SILICON FROM SILANE AND NITROGEN

Mei Chang; David N. K. Wang, both of Cupertino; John M. White, Hayward, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of application No. 07/746,178, Nov. 6, 1996, Pat. No. 5,773,100, which is a continuation of application No. 08/453,135, May 24, 1995, abandoned, which is a continuation of application No. 08/272,959, Jul. 11, 1994, abandoned, which is a continuation of application No. 07/809,050, Dec. 17, 1991, abandoned, which is a continuation of application No. 07/345,977, Apr. 28, 1989, abandoned, which is a continuation of application No. 07/085,424, Aug. 14, 1987, Pat. No. 4,854,263. This application Apr. 14, 1998, Appl. No. 59,734. This patent is subject to a terminal disclaimer.

Int. Cl.[7] B05D *3/06;* **C23C** *16/30*

U.S. Cl. 427—579 **5 Claims**



1. A plasma enhanced chemical vapor deposition process for the deposition of compounds of silicon selected from the group consisting of silicon oxide and silicon oxynitride having a substantially uniform thickness on a substrate from a mixture of precursor gases including silane comprising

activating said precursor gases by passing them through a parallel plate electrode having a face plate including an array of tapered openings therein, wherein the openings for gas inlet are smaller than the openings for gas outlet and the taper is

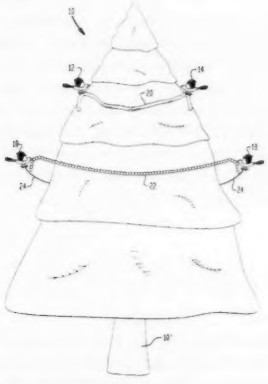
sufficient to increase the dissociation of one or more precursor gases as they pass through said faceplate, while applying radio frequency energy to the plate.

6,040,023

DECORATIVE TREE DEVICE

Anthony J. Salerno, 3252 Banta Rd., South Plainfield, N.J. 07080

Filed May 14, 1998, Appl. No. 78,782
Int. Cl.[7] A01N *1/00*
U.S. Cl. 428—16 **22 Claims**



13. A tree decoration comprising:

a. a figurine;

b. an elongate decorative member attached to said figurine, said elongate decorative member being so constructed and decorative that it can be extended on or adjacent to a tree at a location remote from said figurine to provide a decorative arrangement together with said figurine; and

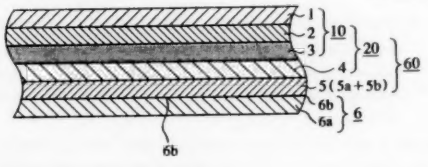
c. a fastener adapted to fasten said figurine to a tree.

6,040,024

LAMINATED FILM, METHOD FOR PRODUCTION THEREOF, AND BAG AND PACKAGE USING THE LAMINATED FILM

Yoshiaki Tokita, Urayasu, and Takahiro Takagi, Saitama-ken, both of Japan, assignors to Kyodo Shiko Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1998, Appl. No. 25,868
Claims priority, application Japan, Mar. 26, 1997, 9-091480
Int. Cl.[7] B32B *7/06;27/00;27/08;27/32;* **B65D** *65/40*
U.S. Cl. 428—35.2 **13 Claims**



1. A laminated film comprising:

an outer-layer-film including one or more layers;

a water-soluble film; and

an intermediate layer interposed between said outer-layer-film and said water-soluble film, said intermediate layer containing high-pressure polyethylene oxidized at least on a surface thereof contiguous to said water-soluble film to such a degree that said intermediate layer and said water-soluble film adhere so weakly to each other as to be peelable;

wherein said outer-layer-film and said intermediate layer adhere fast to each other;

said intermediate layer and said water-soluble film directly contact each other and adhere so weakly to each other as to be peelable; and

said water-soluble film includes a water-soluble substrative film and a water-soluble anchor coating agent distributed on a surface of said water-soluble substrative film contiguous to said intermediate layer.

6,040,025

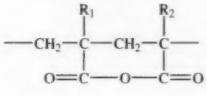
ADHESION BINDER CONTAINING GLUTARIMIDE MOIETIES

Serge Lorek, Pau, France, assignor to Elf Atochem S.A., Puteaux, France

Division of application No. 08/537,929, filed as application No. PCT/FR94/00488, Apr. 28, 1994. This application May 11, 1998, Appl. No. 75,771.
Int. Cl.[7] B29D *9/00;23/00;* **B29K** *85/00;105/26*
U.S. Cl. 428—35.9 **13 Claims**

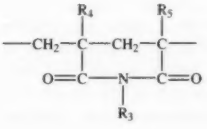
1. Multilayer material comprising in order a layer of fluorinated polymer, a layer of binder for a fluorinated polymer, which enables said binder to adhere to polymers with which it is incompatible, characterized in that said binder comprises a polymer A containing the following moieties:

(1)



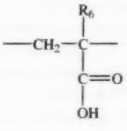
in which R_1 and R_2, which may be identical or different, represent H or a linear or branched alkyl having from 1 to 20 carbon atoms;

(2)



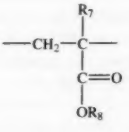
in which (i) R_4 and R_5, which may be identical or different, represent H or a linear or branched alkyl having 1 to 20 carbon atoms, and (ii) R_3 represents H, an alkyl, cycloalkyl, aryl, alkaryl, aralkyl or a heterocycle;

(3)



in which R_6 represents H or a linear or branched alkyl having from 1 to 20 carbon atoms; and

(4)



in which R_7 represents H or a linear or branched alkyl having from 1 to 20 carbons and R_8 represents a linear or branched alkyl having from 1 to 20 carbon atoms; and a layer of polymer which is incompatible with the fluorinated polymer.

6,040,026

PRESSURE-SENSITIVE ADHESIVE SHEET AND LAMINATE OF PRESSURE-SENSITIVE ADHESIVE SHEETS

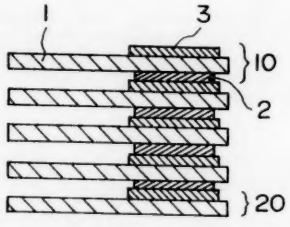
Hiroaki Iwabuchi, Urawa; Yoichi Sone, Kumagaya, and Tetsuyuki Utagawa, Kawaguchi, all of Japan, assignors to LINTEC Corporation, Tokyo, Japan

Filed Nov. 21, 1997, Appl. No. 976,037

Claims priority, application Japan, Nov. 29, 1996, 8-319247

Int. Cl.[7] C09J *7/02*

U.S. Cl. 428—40.1 **13 Claims**



1. A pressure-sensitive adhesive sheet which comprises a substrate sheet, a pressure-sensitive adhesive layer formed on at least part of one side of said substrate sheet and a release layer formed on at least part of the other side of said substrate sheet, said release layer being a cured product of an ionizing radiation-curable releasable resin selected from the group consisting of an ultraviolet-sensitive, cationically curable silicone resin containing a cationic photopolymerization catalyst and an ultraviolet sensitive, photoactive platinum-based catalyst-containing silicone resin.

6,040,027

COMPOSITE FACESTOCKS

Melvin S. Freedman, Beachwood, Ohio, assignor to Avery Dennison Corporation, Pasadena, Calif.

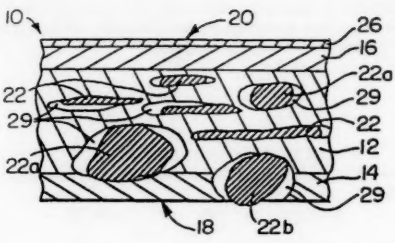
Continuation of application No. 08/439,690, May 12, 1995, Pat. No. 5,700,564, which is a continuation of application No. 08/255,571, Jun. 8, 1994, abandoned, which is a continuation of application No. 07/937,066, Aug. 26, 1992, abandoned, which is a continuation of application No. 07/758,385, Sep. 3, 1991, Pat. No. 5,143,570, which is a continuation of application No. 07/322,720, Mar. 13, 1989, abandoned, which is a division of application No. 07/088,402, Aug. 24, 1987, Pat. No. 4,488,075, which is a division of application No. 06/853,772, Apr. 18, 1986, Pat. No. 4,713,273, which is a continuation-in-part of application No. 06/699,204, Feb. 5, 1985, abandoned. This application Dec. 5, 1997, Appl. No. 985,946.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B32B *27/32*

U.S. Cl. 428—40.1 **31 Claims**

1. A multilayer film facestock having an overall thickness of from 1.5 mils to about 6.5 mils for use in pressure-sensitive



adhesive label applications comprising a coextrudate of at least two layers comprising a base layer and at least one skin layer wherein the base layer is thicker than the skin layer, said coextrudate having a face side, said base layer comprising a propylene polymer or copolymer containing filler particles, and having a stiffness of from about 10 to 100 Gurley, and said skin layer being on the face side of the coextrudate and having an ink-printable surface, wherein said multilayer film facestock is suitable for die-cutting and stripping.

6,040,028

REMOVABLE POLYURETHANE ADHESIVES WITH IMPROVED TEMPERATURE RESISTANCE PROPERTIES

Robert L. Cline, Paden City; James W. Rosthauser, Glendale, both of W. Va., and Peter H. Markusch, McMurray, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1998, Appl. No. 6,129

Int. Cl.[7] C09J *7/02*

U.S. Cl. 428—41.8 **4 Claims**

1. In a process for coating a substrate comprising applying a composition to a substrate, and allowing the composition to cure, the improvement wherein said composition comprises a highly elastic polyurethane contact adhesive which is the reaction product of a mixture consisting of

a) a polyisocyanate or polyisocyanate adduct having a functionality of less than about 4,

and

b) a polyol component consisting of:

1) about 90 to 100% by weight, based on 100% by weight of component b), of at least one polyether having a molecular weight of from about 1,800 to 12,000 and an average functionality of from about 1.5 to about 4,

and

2) up to about 10% by weight, based on 100% by weight of component b), of at least one chain extender containing hydroxyl groups and having a molecular weight of from about 60 to 400 and an average functionality of from about 1.5 to about 3,

wherein at least one of components a) and b) have an average functionality greater than 2.2 and the functionalities and quantities of components a) and b) are selected such that the molecular weight between crosslinks of the resultant polyurethane is from about 7,000 to about 16,000, the equivalent ratio of isocyanate groups to isocyanate-reactive groups present in the resultant polyurethane is from about 80:1000 to about 120:100 and the urethane group content of the resultant polyurethane is from about 1 to about 8%.

6,040,029

GLASS SUBSTRATE OF DISK FOR RECORDING INFORMATION, A DISK FOR RECORDING INFORMATION, AND A DISK DEVICE FOR RECORDING INFORMATION

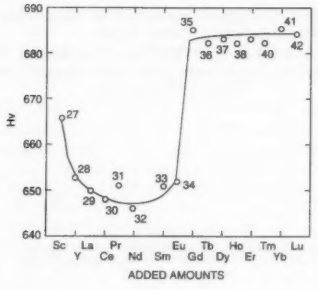
Hiroki Yamamoto, Hitachi; Takashi Naito, Hitachioota; Takashi Namekawa, Hitachi; Ken Takahashi, Tokai-mura; Masahiro Watanabe, Yokohama, and Noriyuki Takeo, Yamakita-machi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 3, 1997, Appl. No. 888,124

Claims priority, application Japan, Jul. 18, 1996, 8-189058; Oct. 24, 1996, 8-282068

Int. Cl.[7] G11B *5/82*

U.S. Cl. 428—64.1 **25 Claims**



1. A glass substrate of a disk for recording information comprising a layer for recording information, which is provided on at least a portion of a surface of the glass substrate, wherein

said substrate is made of glass containing at least one of the rare earth elements selected from a group consisting of Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu in the range of 0.5–30% by weight to the total amount of said glass on a basis of converted weight to oxide of Ln_2O_3 (Ln is a rare earth element).

6,040,030

OPTICAL RECORDING MEDIUM

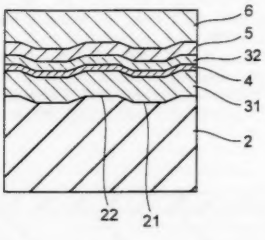
Hajime Utsunomiya; Tatsuya Kato, and Hiroyasu Inoue, all of Chou-ku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 15, 1998, Appl. No. 153,294

Claims priority, application Japan, Sep. 19, 1997, 9-273937

Int. Cl.[7] B32B *3/00*

U.S. Cl. 428—64.1 **12 Claims**



1. A method for recording/reproducing an optical recording medium of phase change type comprising a substrate having a thickness of up to 0.8 mm wherein lands and grooves on opposite sides of the land are formed on the surface, and both the lands and the grooves are used as recording tracks, wherein

the medium is overwritten at a recording power Pw (mW) and an erasing power Pe (mW) which meet the relation:

$$(Pw/Pe)\times k^2 \leqq 8.5$$

when the medium has a recording track pitch P (μm), the recording/reproducing optical system has a numerical aperture NA, and the recording/reproducing light has a wavelength λ (μm) which meet the relation:

$$k=(\lambda/NA)/P \geqq 1.78.$$

6,040,031

CONTACT RECORDING MAGNETIC DISK DEVICE

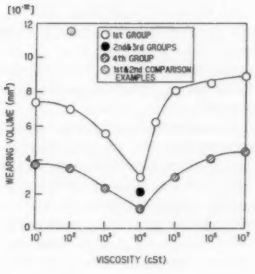
Masahiro Yanagisawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 13, 1997, Appl. No. 815,630

Claims priority, application Japan, Mar. 13, 1996, 8-055869; Nov. 17, 1996, 8-315986

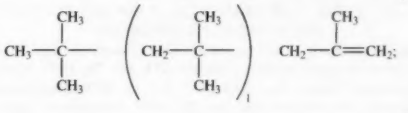
Int. Cl.[7] G11B *5/71*

U.S. Cl. 428—65.4 **16 Claims**

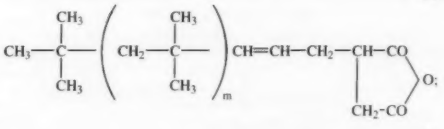


1. A magnetic recording disk comprising a body coated with a lubricant thin film made from one of polybutene, maleic-anhydride-modified polybutene or maleic-anhydride-modified poly-alpha-olefin selected from formula (1), (2) or (3):

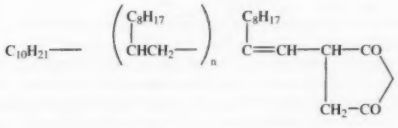
(1)



(2)



(3)



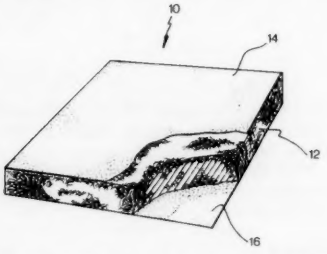
where l is an integer from 3 to 100, while m and n are integers from 1 to 10; and wherein said film has a viscosity in the range from 100 cSt to 100,000 cSt.

6,040,032

ABSORBENT ARTICLE FOR COLLECTING NON-AQUEOUS LIQUIDS AND A METHOD FOR MANUFACTURING THE ABSORBENT ARTICLE

Joseph Isräel, 111 Old Bay Rd., Belcheltown, Mass. 01007, and Yvon Levesque, 3103 St. Catherine, Montreal, Quebec, Canada, H1W 2E6

Filed Apr. 28, 1993, Appl. No. 54,448
Int. Cl.[7] B32B *5/00;9/04;* **B27N** *3/00*
U.S. Cl. 428—98 **20 Claims**



1. An absorbent article for collecting a non-aqueous liquid comprising a low density, hydrophobic, structurally integral board of peat moss material manifesting an affinity for the non-aqueous liquid, wherein said board of peat moss material is capable of absorbing the non-aqueous liquid under the effect of capillary pressure.

14. A method for manufacturing a low density, structurally integral article for collecting a non-aqueous liquid, said method comprising the steps of:

a) forming a liquid suspension of peat moss material;

b) sheeting said suspension on a layer of fibers;

c) extracting fluidizing medium from said suspension to form a low density board of peat moss material to cause said fibers to adhere to said peat moss material;

d) drying said board of peat moss material at a temperature above 100° C. to evaporate residual moisture;

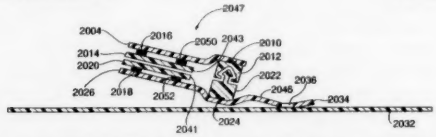
said method being completed without conditioning said peat moss material with wetting agent to preserve a natural hydrophobicity of the peat moss material in order to impede water penetration in the article.

6,040,033

FASTENER TAPE MATERIAL, BAG UTILIZING FASTENER TAPE MATERIAL, AND METHOD OF MANUFACTURE THEREOF

James R. Johnson, 3819 Greenhill Dr., Chamblee, Ga. 30341

Division of application No. 08/899,434, Jul. 24, 1997, Provisional application No. 60/022,353, Jul. 24, 1996, Provisional application No. 60/036,186, Jan. 18, 1997, Provisional application No. 60/035,051, Jan. 22, 1997. This application Aug. 13, 1998, Appl. No. 133,796.
Int. Cl.[7] B32B *3/06*
U.S. Cl. 428—99 **3 Claims**



1. An elongate web having a length and a width comprising a multiplicity of fastener tape segments connected to said web at longitudinally spaced intervals and extending substantially perpendicularly to said web length;

each of said fastener tape segments including a flexible interlocked fastener comprising a bottom fastener element and a top fastener element disposed on said bottom fastener element;

said bottom fastener element having a lip extending in a first longitudinal direction and a flange extending in a direction opposite to said first longitudinal direction, said lip being sealed to said web along a lip seal;

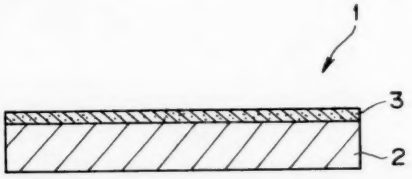
said top fastener element having a flange extending in said direction opposite to said first longitudinal direction and being substantially free of any extension in said first longitudinal direction wherein said top and bottom fastener elements and flanges are longitudinally spaced from said lip seal in said direction opposite to said first longitudinal direction and are unconnected to said web.

6,040,034

LAPPING TAPE

Kesao Okada, and Shigeo Kurose, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 23, 1998, Appl. No. 64,312
Claims priority, application Japan, Apr. 25, 1997, 9-123198
Int. Cl.[7] D06N *7/04*
U.S. Cl. 428—143 **7 Claims**



1. A lapping tape having, on a flexible substrate, a lapping layer obtained by coating a paint for the formation of a lapping layer which contains inorganic powders, a binder and solvents, and then drying, wherein:

said solvents in the paint contain an organic solvent having a boiling point of not less than 120° C. in an amount of 20 to 60 wt. % based on the total amount of organic solvents;

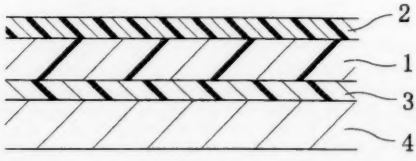
said lapping layer has a thickness of 3 to 25 μm; and the remaining amount of said solvents in the lapping layer is not greater than 500 g/m^3.

6,040,035

WATER-COLOR INK ABSORBING MATERIAL AND LAMINATED FILM HAVING LAYER OF THE ABSORBING MATERIAL

Hiroki Satoh; Yoshio Taguchi, and Noriko Shoyama, all of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

PCT No. PCT/JP97/04032, § 371 Date Jul. 10, 1998, § 102(e) Date Jul. 10, 1998, PCT Pub. No. WO98/21048, PCT Pub. Date May 22, 1998
PCT Filed Nov. 5, 1997, Appl. No. 101,191
Claims priority, application Japan, Nov. 11, 1996, 8-298431; Nov. 11, 1996, 8-298434; Mar. 14, 1997, 9-060640
Int. Cl.[7] B41M *5/00;* **C08L** *75/08;* **D21H** *19/16*
U.S. Cl. 428—195 **17 Claims**



1. A water-base ink absorbing material adapted to be provided on a surface of a base to receive a water-base ink, said water-base

ink absorbing material including a water absorbing agent and polyurethane resin synthesized by using polyether polyol including polyethylene oxide, wherein

30 to 500 weight parts of collagen as the water absorbing agent are mixed with 100 weight parts of polyurethane resin synthesized by using polyether polyol including polyethylene oxide.

6,040,036

SHEETS HAVING A MICROVOIDED LAYER OF STRENGTH SUFFICIENT TO PREVENT BEND CRACKING IN AN IMAGING MEMBER

Peter T. Aylward, Hilton; Robert P. Bourdelais, Pittsford; Douglas N. Haydock, Webster, and Thaddeus S. Gula, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of application No. 08/862,335, May 23, 1997, Pat. No. 5,935,690. This application May 11, 1999, Appl. No. 310,041.

Int. Cl.[7] B32B *3/00*

U.S. Cl. 428—195 **19 Claims**

1. A laminated base for imaging comprising a paper base, a sheet of microvoided biaxially oriented polyolefin polymer on the top of said base and a sheet of biaxially oriented film on the bottom of said paper base, wherein said top microvoided sheet has a thickness of 0.020 mm to 0.050 mm, a density of between 78 and 100 percent of solid polyolefin polymer density and wherein said base is substantially free of distortion when the base is wrapped around a rod of 8.0 mm diameter.

6,040,037

LOW-RESISTANCE INTERCONNECTOR AND METHOD FOR THE PREPARATION THEREOF

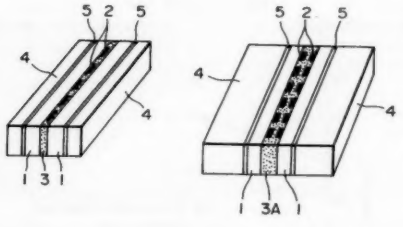
Tsuyoshi Imai, Nagano-ken, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1996, Appl. No. 724,139

Claims priority, application Japan, Sep. 29, 1995, 7-252846

Int. Cl.[7] B32B *3/00;* **H01R** *4/58;* **H01H** *47/00*

U.S. Cl. 428—209 **10 Claims**



1. A low-resistance interconnector which is an integral elongated strip of a sheet having flat surfaces consisting of three elongated sectional parts conjoined together side-by-side to form the flat surfaces of the sheet including two side sectional parts and one center sectional part sandwiched between the side sectional parts, the side sectional parts being made each from an electrically insulating rubbery elastomer and the center sectional part being a composite body consisting of an electrically insulating adhesive as a matrix and a plurality of electroconductive elements embedded in the matrix each in parallel to the others arranged in an array running in the direction substantially perpendicular to the flat surfaces of the strip of sheet at a regular pitch and made from an electroconductive polymeric composition comprising a polymeric matrix and silver particles dispersed therein and having a volume resistivity in the range from 2×10^{-4} to 5×10^{-4} ohm.cm at room temperature.

6,040,038

FILM CONDENSER AND METALIZED FILM

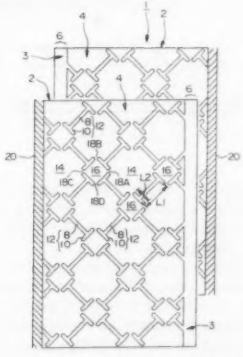
Mitsuru Momose, Aizuwakamatsu, Japan, assignor to Mitsubishi Shindoh Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1997, Appl. No. 972,994

Claims priority, application Japan, Nov. 22, 1996, 8-312356; Nov. 22, 1996, 8-312357; Nov. 22, 1996, 8-312361

Int. Cl.[7] B32B *9/00;* **H01G** *4/06*

U.S. Cl. 428—209 **13 Claims**



1. A metalized film comprising a base film formed from an insulating material, and a metal coating layer formed on said base film, wherein a plurality of uncoated portions are formed as area partition margins in said metal coating layer so as to respectively form, in said metal coating layer, a plurality of electrode regions, a plurality of fuse connecting regions surrounded by two or more of said electrode regions, and a plurality of fuse portions electrically connecting each one of said fuse connecting regions with said electrode regions surrounding said one of said fuse connecting regions, and wherein each of said fuse connecting regions has an area which is smaller than that of each of said electrode regions.

6,040,039

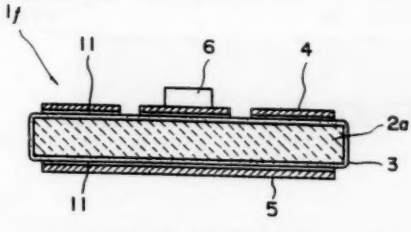
SILICON NITRIDE CIRCUIT BOARD

Kazuo Ikeda; Hiroshi Komorita; Yoshitoshi Sato; Michiyasu Komatsu, and Nobuyuki Mizunoya, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/666,467, filed as application No. PCT/JP96/00723, Mar. 19, 1996. This application Nov. 14, 1997, Appl. No. 970,811.

Int. Cl.[7] B32B *3/27*

U.S. Cl. 428—210 **4 Claims**



1. A silicon nitride circuit board comprising:

a high thermal conductive silicon nitride substrate including a silicon nitride crystal phase and a grain boundary phase, having a ratio of a crystallized compound phase to an overall grain boundary phase which is at least 20%, and having a thermal conductivity of at least 60 W/m K;

a first oxide layer having a thickness of 0.5 to 10 μm, which is formed on a surface of said silicon nitride substrate; and

a metal circuit plate directly bonded to said silicon nitride substrate through said oxide layer.

6,040,040

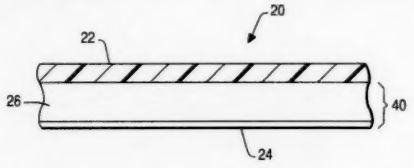
MULTI-LAYER THERMAL TRANSFER MEDIA FROM SELECTIVELY CURABLE FORMULATIONS

David J. Rainbow, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 28, 1998, Appl. No. 14,473

Int. Cl.[7] B23B *7/02*

U.S. Cl. 428—212 **27 Claims**



1. A thermal transfer medium which transfers images to a receiving substrate when exposed to an operating print head of a thermal transfer printer, said thermal transfer medium comprising:

a) a flexible supporting substrate and

b) a thermosensitive coating positioned on said substrate comprising a sensible material, uncured monomers and/or oligomers which are selectively curable and polymers of said selectively curable monomers and/or oligomers,

wherein the polymers of the selectively curable monomers and/or oligomers are concentrated at the top of said coating to provide a cured region at the top surface of said coating and the uncured monomers and/or oligomers which are selectively curable are concentrated at the bottom surface of said coating which contacts the flexible supporting substrate; to provide a uncured region at the bottom surface of said coating, and

wherein the total amount of uncured monomers and/or oligomers which are selectively curable, plus the amount of polymers of the selectively curable monomers and/or oligomers, falls within the range of from 10 to 70 wt. %, based on the dry components of said coating.

6,040,041

MAGNETIC RECORDING MEDIUM

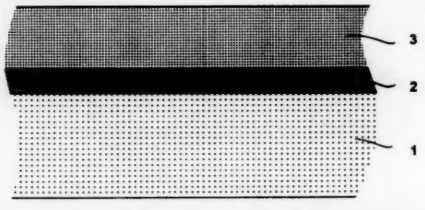
Klaus Götz, Neustadt; Helmut Jakusch, Frankenthal; Werner Loch, Neuried; Erich Hoffmann, Heidelberg; Hans-Georg Gottmann; Hans-Joachim Jenor, both of München, and Johann Voit, Gilching, all of Germany, assignors to EMTEC Magnetics GmbH, Germany

Filed Feb. 12, 1998, Appl. No. 22,673

Claims priority, application Germany, Apr. 5, 1997, 197 14 161

Int. Cl.[7] G11B *5/706*

U.S. Cl. 428—216 **6 Claims**



1. A magnetic recording medium consisting of a nonmagnetic substrate and at least two magnetic layers applied thereon, both layers containing magnetizable metal oxides as magnetic pigment, the magnetic pigment consisting of cobalt-containing FeOx ($1.33 \leqq x \leqq 1.5$) and present in the uppermost layer having a higher BET value than the magnetic pigment contained in the lowermost layer, and the layer thickness of the uppermost layer being greater than that of the lowermost layer, wherein the thickness of the uppermost layer is in the range of 3.1–5 μm and that of the lowermost layer is in the range of 1.1–3 μm, and wherein the magnetic pigment contained in the lowermost layer is Cr-O_2.

6,040,042

COMPOSITE PLASTICS FILM OR SHEET

David Thomson Dalgleish, Frinton-on-Sea, and Matthew Richard Sands, Colchester, both of United Kingdom, assignors to Arjobex Limited, Hertfordshire, United Kingdom

Filed Mar. 2, 1998, Appl. No. 33,024

Claims priority, application United Kingdom, Mar. 4, 1997, 9704470

Int. Cl.[7] B32B *5/14*

U.S. Cl. 428—308.4 **22 Claims**

4. A synthetic paper comprising at least one printable surface layer and at least a base layer, said paper comprising a formulation comprising a polyolefin, a filler and a voiding agent, wherein the voiding agent is a pentaerythritol ester of maleic rosin.

6,040,043

PARTICLES FOR LOWER LAYER OF COATING TYPE MAGNETIC RECORDING MEDIUM

Seiichi Hisano, Chiba; Kazuhisa Saito, Okayama; Kazushi Sano, Okayama; Shinichi Konno, Okayama; Yoshichika Horikawa, Okayama, and Yasuhiko Aihara, Okayama, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

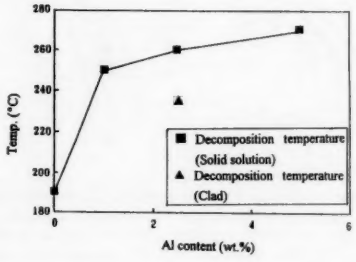
PCT No. PCT/JP97/00927, § 371 Date Nov. 20, 1997, § 102(e) Date Nov. 20, 1997, PCT Pub. No. WO97/34830, PCT Pub. Date Sep. 25, 1997

PCT Filed Mar. 21, 1997, Appl. No. 952,438

Claims priority, application Japan, Mar. 21, 1996, 8-89976; Aug. 5, 1996, 8-220746

Int. Cl.[7] G11B *5/68*

U.S. Cl. 428—323 **5 Claims**



1. A magnetic recording medium comprising a substrate, a non-magnetic layer comprising acicular iron oxyhydroxide particles and a resinous binder formed on said substrate, and a magnetic layer comprising magnetic particles and resinous binder formed on said non-magnetic layer, said acicular iron oxyhydroxide particles having an average major axis of 0.01 to 0.5 μm and containing not less than 0.1 wt. % and not more than 30 wt. % of Al wherein said acicular iron oxyhydroxide particles release not less than 0.1 wt. % and not more than 2 wt. % of water at 100° C.

6,040,044

DECORATIVE MATERIAL HAVING ABRASION RESISTANCE

Kazuhiro Takahashi; Toshitake Kobayashi; Masataka Takemoto; Takashi Matano, and Haruo Ono, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Continuation of application No. 08/666,407, Aug. 29, 1996, Pat. No. 5,928,778. This application Dec. 17, 1998, Appl. No. 213,896.

Claims priority, application Japan, Oct. 31, 1994, 6-290706; Jun. 1, 1995, 7-158591

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *5/16;27/00*

U.S. Cl. 428—323 **7 Claims**

1. A decorative material comprising:

a substrate; and

an abrasion-resistant coating layer formed on said substrate, said abrasion-resistant coating layer comprising spherical inorganic particles (A) having an average particle diameter of 3 to 50 micrometers and a Knoop hardness of 1,300 kg/mm^2 or more, and a binder (B) comprising a crosslinkable resin having an average molecular weight of crosslinked molecules of from 300 to 700, the amount of said spherical particles (A) being from 5% to 50% by weight of the total amount of the components (A) and (B), the hardness of said spherical particles (A) being higher than that of said binder (B), the average particle diameter d, in micrometers, of said spherical particles (A) fulfilling the following inequality (1):

$$0.3t \leqq d \leqq 3.0t \quad (1)$$

wherein t is an average thickness, in micrometers, of said coating layer.

6,040,045

PARTICLE FILLED RESINOUS PRODUCT OF IMPROVED APPEARANCE

Jorge Alfonso, Pasadena; Leonard R. Elbon, Glen Burnie; Eric A. Franzoi, and Donald Wayne Finnerty, both of Pasadena, all of Md., assignors to Formica Corporation, Warren, N.J.

Provisional application No. 60/038,544, Feb. 28, 1997. This application Feb. 27, 1998, Appl. No. 31,923.

Int. Cl.[7] **B32B** *5/16*

U.S. Cl. 428—327 **17 Claims**

1. A particulate "pearlescent" pigment for plastic products, comprising small hard resin particles of different sizes containing pearlescent reflective flakes which are aligned in each particle with their flat surfaces generally parallel.

6,040,046

MASKING FILM AND METHOD FOR PRODUCING SAME

Farid F. Ghiam, and James P. DiPoto, both of Terre Haute, Ind., assignors to Tredegar Corporation, Richmond, Va.

Filed Jun. 17, 1997, Appl. No. 877,073

Int. Cl.[7] **B32B** *7/12*

U.S. Cl. 428—343 **20 Claims**

1. A masking film, comprising:

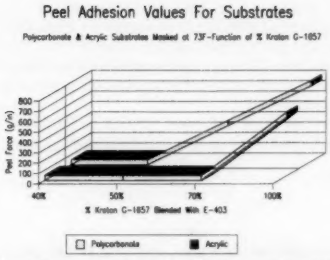
a first side having a smooth surface;

a second side having a rough surface;

said smooth surface of the first side capable of removably adhering to a relatively smooth surface of a substrate due to intimate contact therewith;

said first side further comprising one or more components preselected to affect the amount of adhesion produced between the smooth surface of the first side and the relatively smooth surface of the substrate at a given temperature; and

wherein the two or more components preselected to affect the amount of adhesion produced between the smooth surface of the first side and the relatively smooth surface of the substrate



at a given temperature include at least one primary component and at least one secondary component.

6,040,047

COVER TAPE

Rikiya Yamashita, Tokyo-To, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

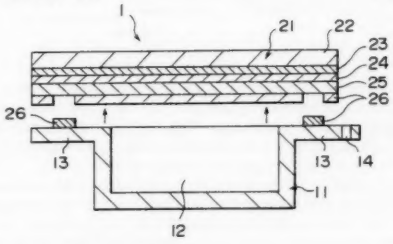
Division of application No. 08/594,888, Feb. 9, 1996, Pat. No. 5,846,652. This application Mar. 11, 1998, Appl. No. 38,414.

Claims priority, application Japan, Apr. 27, 1995, 7-127297

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *7/12*

U.S. Cl. 428—343 **6 Claims**



1. A cover tape comprising:

a biaxially oriented resin layer,

a heat sealant layer, and

an intermediate layer located adjacent to said heat sealant layer and between said biaxially oriented resin layer and said heat sealant layer,

wherein said intermediate layer comprises a resin composition including 30 to 50% by weight of an ethylene-α-olefin copolymer having a density of from 0.915 to 0.940 g/cm^3, and 70 to 50% by weight of a styrene-butadiene block copolymer composed of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene.

6,040,048

ENERGY BEAM CURABLE HYDROPHILIC PRESSURE SENSITIVE ADHESIVE COMPOSITION AND USE THEREOF

Kiichiro Kato; Takeshi Kondoh, both of Urawa; Katsuhisa Taguchi, Koshigaya, and Kazuhiro Takahashi, Kawaguchi, all of Japan, assignors to Lintec Corporation, Japan

Filed Aug. 27, 1998, Appl. No. 141,385

Claims priority, application Japan, Aug. 28, 1997, 9-232238

Int. Cl.[7] **B32B** *7/12*

U.S. Cl. 428—345 **8 Claims**

1. An energy beam curable hydrophilic pressure sensitive adhesive composition comprising a hydrophilic pressure sensitive adhesive (A) and an energy beam polymerizable compound (B),

wherein the hydrophilic pressure sensitive adhesive (A) is composed of a pressure sensitive adhesive composition formed from:

a carboxyl group containing copolymer obtained by polymerizing a first polymerizable monomer (A1) containing a carboxyl group and a second monomer (A2) that is copolymerizable with the first polymerizable monomer (A1) containing the carboxyl group according to solution polymerization,

a neutralizer (A3), and

a crosslinking agent (A4).

6,040,049

COMPOSITE FILM AND METHOD OF MANUFACTURING SURFACE COATING MATERIAL

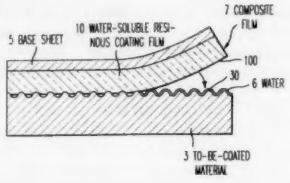
Youji Tominaga; Kazuo Toda, and Nobuo Yamamura, all of Tsushima, Japan, assignors to GEN Maintenance Technology Inc., Tsushima, Japan

Filed Oct. 20, 1997, Appl. No. 953,993

Claims priority, application Japan, Oct. 21, 1996, 8-298165; Jan. 16, 1997, 9-019710; Sep. 2, 1997, 9-254347

Int. Cl.[7] B32B *7/12*

U.S. Cl. 428—355 EN **24 Claims**



1. A composite film comprising a base sheet having a property of transmitting light therethrough, and at least one water-soluble resin coating film thereon, wherein one of said at least one water-soluble resinous coating films has an outer surface which coincides with an outer surface of said composite film, and wherein said composite film is adapted to adhere to a material upon both interposition of water between said outer surface and said material and hardening of the water-soluble resinous coating film having said outer surface to form a water-insoluble film, and wherein at least one of said water-soluble resinous coating films is hardened by irradiation.

6,040,050

POLYBENZAZOLE FIBER HAVING HIGH TENSILE MODULUS AND PROCESS OF MANUFACTURE THEREOF

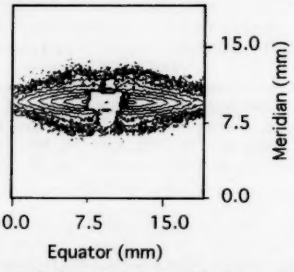
Tooru Kitagawa, and Michio Ishitobi, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka-fu, Japan

Filed Jun. 16, 1998, Appl. No. 97,997

Claims priority, application Japan, Jun. 18, 1997, 9-161554; Oct. 14, 1997, 9-280789

Int. Cl.[7] B02G *3/00*

U.S. Cl. 428—364 **13 Claims**



1. A polybenzazole fiber obtained through a heat treatment, said fiber having a tensile modulus of not less than 300 GPa and a tensile strength of not less than 5.0 GPa, said fiber having at least one of the following properties are determined by an X-ray analysis of a fine structure of said fiber:

(1) a crystal orientation parameter $<\sin^2\Phi>$ of not more than 0.009 as determined by a wide-angle X-ray diffraction method, and

(2) absence of an equatorial streak, a two-point pattern or a four-point pattern in a small-angle X-ray scattering.

6,040,051

CARBON FIBERS AND PROCESS FOR THEIR PRODUCTION, AND FIBER-REINFORCED RESIN COMPOSITION EMPLOYING THEM

Iwao Yamamoto; Eisaku Kakikura; Masami Kinouchi; Yoshiaki Inoue, and Tamotsu Shiotsu, all of Sakaide, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

PCT No. PCT/JP97/01985, § 371 Date Feb. 10, 1998, § 102(e) Date Feb. 10, 1998, PCT Pub. No. WO97/47799, PCT Pub. Date Dec. 18, 1997

PCT Filed Jun. 10, 1997, Appl. No. 11,064

Claims priority, application Japan, Jun. 10, 1996, 8-147033; Sep. 19, 1996, 8-247947

Int. Cl.[7] B32B *9/00*

U.S. Cl. 428—367 **15 Claims**

1. Bundled and cut carbon fibers having a bulk density of from 450 g/l to 650 g/l, which are obtained by bundling carbon fibers having a yield of at least 0.9 g/m followed by cutting, and having a collapse initiating angle and funnel drop time of at most 65° and at most 20 seconds, respectively.

6,040,052

MAGNETIC RECORDING MEDIUM

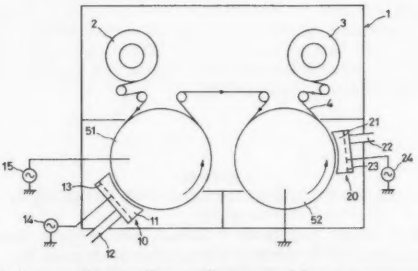
Hiromichi Kanazawa; Kunihiro Ueda, both of Saku; Katsuaki Yanagiuchi, Koromo; Tsunehiko Ikarashi, and Masahide Kohno, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 10, 1998, Appl. No. 58,135

Claims priority, application Japan, Apr. 11, 1997, 9-110151

Int. Cl.[7] B32B *9/00*

U.S. Cl. 428—408 **3 Claims**



1. A magnetic recording medium comprising a non-magnetic support having on at least one surface thereof a magnetic layer, a protective layer formed on said magnetic layer, and a lubricant layer formed on said protective layer, wherein said magnetic recording medium is obtained by that after forming the magnetic layer on the surface of the non-magnetic support conveyed along the surface of a cooling roll, a carbon-containing plasma polymerized film is formed on the magnetic layer as the protective layer, while conveying the non-magnetic support having the magnetic layer along the surface of a cooling roll, and after surface-treating the carbon-containing plasma polymerized film on the same cooling roll as the protective layer-forming roll or on a different cooling roll from the protective layer-forming roll without applying a bias voltage to the surface-treatment roll, whereby a double bond component of carbon and oxygen is incorporated in the surface of the carbon-containing plasma polymerized film at a ratio

of from 1.4 to 7.5 atomic % to the whole carbon amount of the surface of the carbon-containing plasma polymerized film, and the lubricant layer made up of an ester of a fluorinated alcohol and a fatty acid is then formed on the carbon-containing plasma polymerized film.

6,040,053

COATING COMPOSITION HAVING ANTI-REFLECTIVE AND ANTI-FOGGING PROPERTIES

Matthew T. Scholz, Woodbury, and George V. Tiers, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of application No. 08/684,527, Jul. 19, 1996, Pat. No. 5,723,175. This application Mar. 2, 1998, Appl. No. 33,323.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] B32B *17/10*

U.S. Cl. 428—412 **5 Claims**

1. An article comprising a substrate having at least one surface coated with a porous inorganic metal oxide network in contact with a silane, or a siloxane oligomer which is formed by the partial or complete hydrolysis and condensation of said silane, wherein said silane or siloxane oligomer comprises at least one hydrophilic anionic group selected from the group consisting of $—OSO_2O^-$, $—SO_2O^-$, CO_2^-, $(—O)_2P(O)O^-$; $—P(O)(O^-)_2$, $—OP(O)(O^-)_2$, $—P(O^-)_2$, and $—OP(O^-)_2$.

6,040,054

CHROMIUM-FREE, METAL SURFACE-TREATING COMPOSITION AND SURFACE-TREATED METAL SHEET

Hisao Odashima; Tomomi Takahashi, both of Okayama, and Toshiyuki Shimizu, Ohtsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1997, Appl. No. 791,077

Claims priority, application Japan, Feb. 1, 1996, 8-016824; Mar. 5, 1996, 8-047286

Int. Cl.[7] B32B *15/08;27/08;27/18;27/30*

U.S. Cl. 428—413 **12 Claims**

1. A chromium-free composition for treating the surface of metals, the composition comprising:

(a) a hydroxyl group-containing organic resin;

(b) a phosphoric acid; and

(c) a metal ion or metal compound capable of supplying ions in the composition, the metal being at least one metal selected from the group consisting of Cu, Co, Fe, Mn, Sn, V, Mg, Ba, Al, Ca, Sr, Nb, Y and Zn,

wherein the composition comprises from about 2 to about 50 parts by weight of the phosphoric acid by 100 parts by weight of the hydroxyl group-containing organic resin, and the composition further comprises at least one colloid, sol, or powder selected from the group consisting of SiO_2, Fe_2O_3, Fe_3O_4, MgO, ZrO_2, SnO_2, Al_2O_3 and Sb_2O_5 said composition being effective to provide corrosion resistance to a metal when applied to the surface of said metal in an amount to provide a coating weight of from about 0.1 g/m^2 to about 3.0 g/m^2 on dry basis.

6,040,055

SURFACE DISCHARGE ELEMENT AND A METHOD OF MAKING THE SAME

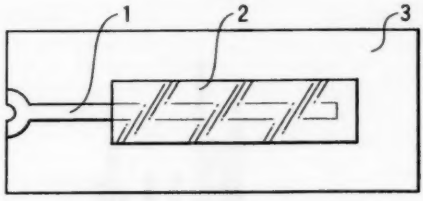
Seiji Baba, Chiba, and Takashi Endo, Chikushino, both of Japan, assignors to Densoken Co., Ltd. & Shoei Chemical Inc., Japan

Filed Jun. 4, 1997, Appl. No. 869,171

Claims priority, application Japan, Jun. 6, 1996, 8-166755

Int. Cl.[7] B32B *17/00*

U.S. Cl. 428—428 **4 Claims**



1. A surface discharge element comprising:

a dielectric substrate;

a discharge electrode on one surface of said substrate; and

an inductive electrode on the other surface of said substrate;

wherein at least said discharge electrode comprises a thick film conductor made of conductive powder and lead-free glass as main constituents.

6,040,056

TRANSPARENT ELECTRICALLY CONDUCTIVE FILM-ATTACHED SUBSTRATE AND DISPLAY ELEMENT USING IT

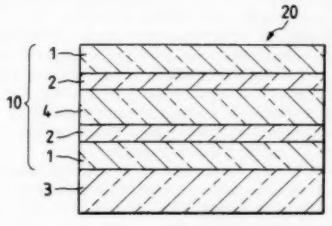
Toshiaki Anzaki, and Etsuo Ogino, both of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed May 29, 1997, Appl. No. 864,985

Claims priority, application Japan, Jun. 7, 1996, 8-145519; Apr. 11, 1997, 9-094061

Int. Cl.[7] C03C *17/36*

U.S. Cl. 428—432 **11 Claims**



1. A transparent electrically conductive film-attached substrate comprising a transparent substrate having formed on one of surface thereof a five-layer transparent electrically conductive film having a sheet resistance of about 2.5 Ω/□ or less, wherein said transparent electrically conductive film is formed by successively laminating onto said substrate a first reflection preventing layer having a thickness of 30 to 70 nm, a first metal layer comprising silver as the main component having a thickness of 5 to 30 nm, a dividing layer having a thickness of 60 to 120 nm, a second metal layer comprising silver as the main component having a thickness of 5 to 30 nm, and a second reflection preventing layer having a thickness of 30 to 70 nm, from said transparent substrate side, and wherein each of said reflection preventing layers and said dividing layer comprises a composite oxide of indium and zinc as the main component.

6,040,057

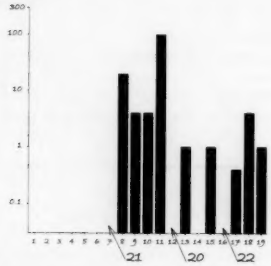
ENHANCING THE STRENGTH, MOISTURE RESISTANCE, AND FIRE-RESISTANCE OF WOOD, TIMBER, LUMBER, SIMILAR PLANT-DERIVED CONSTRUCTION AND BUILDING MATERIALS, AND OTHER CELLULOSIC MATERIALS

Robert A. Slimak, Springfield, Va.; Christian C. Haudenschild, Derwood, Md., and Karen M. Slimak, P.O. Box 2444, Springfield, Va. 22152, assignors to Karen M. Slimak, Springfield, Va.

Filed Apr. 11, 1997, Appl. No. 843,160

Int. Cl.[7] **B05D** *1/18;3/02*

U.S. Cl. 428—453 **11 Claims**



1. A process of imparting fire retardant and moisture resistant properties to a cellulosic material comprising applying and infusing a material consisting of an alkali metal silicate solution, applying energy to said material under sufficient conditions to thereby cause the alkali metal silicate to become water insoluble.

6,040,058

SLIPPERY, TENACIOUSLY ADHERING HYDROPHILIC POLYURETHANE HYDROGEL COATINGS, COATED METAL SUBSTRATE MATERIALS, AND COATED MEDICAL DEVICES

Fritz Hostettler, Lambertville, N.J.; David Rhum, New York, N.Y.; Michael R. Forman, St. Paul, Calif.; Michael N. Helmus, St. Louis Park, and Ni Ding, Plymouth, both of Minn., assignors to Schneider (USA) Inc., Plymouth, Minn.

Division of application No. 08/382,478, Feb. 1, 1995. This application Aug. 27, 1998, Appl. No. 126,374.

Int. Cl.[7] **B32B** *15/08*

U.S. Cl. 428—457 **60 Claims**

1. A material bearing thereon a coating of a lubricious, hydrated hydrophilic polyurethane-polyurea hydrogel, said material being produced by a process comprising the steps of:

a) making a surface of a metal substrate reactive by affixing reactive chemical functional groups thereto, at least a portion of which are amine-containing groups;

b) coating a reactive metal substrate surface which results from step (a) with a first coating comprising a hydrophilic polyurethane prepolymer intermediate, containing terminal isocyanate groups, such that at least a portion of said terminal isocyanate groups are reacted with and are covalently bonded to said reactive chemical functional groups on said substrate surface, forming covalent polyurea bonds therewith, resulting in the formation of a tie coat of a polyurethane-polyurea hydrogel-forming polymer, on said substrate surface, that adheres to said substrate surface, and wherein at least a portion of said terminal isocyanate groups of said polyurethane prepolymer intermediate are present in said polyurethane-polyurea hydrogel-forming polymer such that they remain free to react with other species; and

c) coating a tie coat of the first-coated substrate surface which results from step (b) with a second coating comprising a moisture-containing, hydrogel-forming compound or mixture, which contains isocyanate-reactive functional groups, such that a barrier coat of a lubricious, hydrated hydrogel is formed upon the application of said second coating to said tie coat;

wherein said moisture of said hydrogel-forming compound or mixture is bound with said polyurethane-polyurea hydrogel-forming polymer of said tie coat to form a hydrogel of said barrier coat, on said tie coat, such that said hydrogel is a polyurethane-polyurea polymer hydrogel; and

wherein said isocyanate-reactive functional groups of said hydrogel-forming compound or mixture are reacted with and are covalently bonded to at least a portion of said terminal isocyanate groups of said polyurethane-polyurea hydrogel-forming polymer that remain free to react with other species, thereby directly attaching said polyurethane-polyurea polymer hydrogel to said tie coat and thus also indirectly attaching to said substrate surface.

6,040,059

COMPONENT MADE OF AN ALUMINIUM SILICON CAST ALLOY

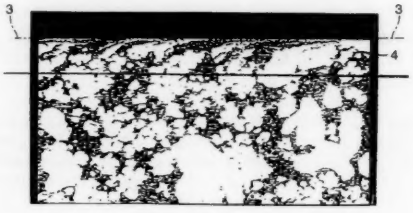
Stefan Birkner, Neuhaus; Ernst Strian, Kunreuth, and Markus Kreibiehl, Weisendorf, all of Germany, assignors to LuK GmbH & Co., Germany

Filed Nov. 9, 1998, Appl. No. 189,195

Claims priority, application Germany, Nov. 18, 1997, 197 51 002

Int. Cl.[7] **B32B** *9/00*

U.S. Cl. 428—469 **5 Claims**



1. An aluminum silicon cast alloy component with at least part of its surface is subjected to anodizing to form an oxide layer with a surface proximate deformation zone configured as a homogeneous zone in which an eutectic network of silicon and aluminum and a primary aluminum mixed crystal are uniformly and thoroughly mixed with each others.

6,040,060

HIGH UNIFORM GLOSS INK-JET RECEIVERS

Gregory E. Missel, Penfield, and Charles E. Romano, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1997, Appl. No. 948,831

Int. Cl.[7] **B41M** *5/00*

U.S. Cl. 428—478.2 **9 Claims**

1. An image recording element for inkjet ink images comprising, in the following order, a support, a base layer and a top layer, wherein:

the base layer comprises gelatin and a material selected from the group consisting of carboxymethyl cellulose, polyvinylpyrrolidone, polyvinylalcohol, hydroxyethyl cellulose and mixtures thereof, said base layer having a thickness of 3 to 20 μm; and

the top layer consists essentially of a material selected from the group consisting of an acrylic acid-diallyldimethylammonium chloride-hydroxypropyl acrylic copolymer and acrylic acid-diallyldimethylammonium chloride polymer, said top layer having a thickness of 0.25 to 1.0 μm.

6,040,061

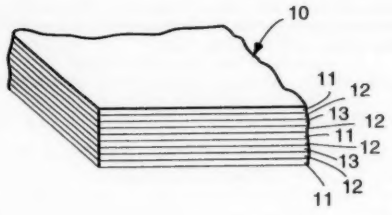
TEAR RESISTANT MULTILAYER FILMS BASED ON SEBACIC ACID COPOLYESTERS AND ARTICLES INCORPORATING SUCH FILMS

Ralph H. Bland, St. Paul, Minn.; James M. Jonza, Round Rock, Tex.; James D. Smith, St. Paul, Minn.; Jeffrey F. Bradley, Woodbury, Minn., and Kenneth B. Smith, Shoreview, Minn., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Oct. 1, 1992, Appl. No. 955,116

Int. Cl.[7] B32B *27/36*

U.S. Cl. 428—480 56 Claims



1. A tear resistant film comprising a total of at least three stiff and ductile layers situated one on the other in a parallel array, the layers occurring essentially randomly in the array wherein (a) at least one layer is a stiff polyester or copolyester that has a tensile modulus greater than 200 kpsi, (b) at least one other layer is a ductile sebacic acid based copolyester that (i) comprises at least 1 mole equivalent of sebacic acid, including ester derivatives thereof, based on 100 mole equivalents of acid components, including ester derivatives thereof, in the copolyester, (ii) has a tensile modulus less than 200 kpsi, (iii) has a tensile elongation greater than 50%, and (iv) provides from about 1 weight percent to 50 weight percent of the tear resistant film, and (c) the tear resistant film demonstrates a Graves area in one direction of the film which exceeds the Graves area, in the same direction, of a single layer film having a thickness substantially equal to the thickness of the tear resistant film, the single layer film including only the stiff polyester or copolyester of the tear resistant film.

6,040,062

AQUEOUS COATING COMPOSITIONS FOR ENVIRONMENTAL ETCH RESISTANT COATINGS

John D. McGee, Highland; Donald H. Campbell, Wixom, and John W. Rehfuss, West Bloomfield, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Continuation of application No. 08/513,587, Aug. 10, 1995, Pat. No. 5,726,244. This application Jun. 2, 1997, Appl. No. 867,547.

Int. Cl.[7] B32B *27/00;* B05D *3/02;* C08L *33/02*

U.S. Cl. 428—500 12 Claims

1. A topcoat coating derived from an aqueous, curable coating composition comprising:

(a) a carbamate-functional grafted acrylic polymer that comprises the reaction product of:

(i) a first acrylic polymer having thereon a functionality (I). and

(ii) a second acrylic polymer having thereon a functionality (II) that is reactive toward the functionality (I) of the first acrylic polymer,

wherein at least one of the first and second acrylic polymers has thereon groups that impart water dispersibility to the grafted acrylic polymer, and further wherein at least one of the first and second acrylic polymers has thereon carbamate functionality; and

(b) a compound having a plurality of functional groups that are reactive with the carbamate functionality.

6,040,063

BIODEGRADABLE POLYESTER AND NATURAL POLYMER LAMINATES

William M. Doane, Morton; John W. Lawton, Jr., Chillicothe, and Randal Shogren, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and Biotechnology Research & Development Corp., Peoria, Ill.

Division of application No. 08/673,273, Jun. 28, 1996, Pat. No. 5,861,216. This application Jan. 15, 1999, Appl. No. 231,729.

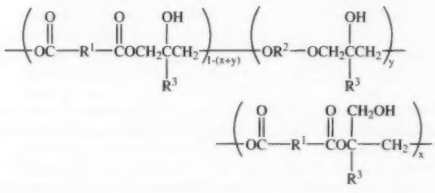
Int. Cl.[7] B32B *23/04*

U.S. Cl. 428—532 11 Claims

1. A moisture resistant, biodegradable, flexible film, comprising:

a self-supporting film including a natural polymer and defining a pair of opposed surfaces, a coating being adhered to at least one of the opposed surfaces and including an hydroxy-functional polyester having repeating units represented by Formula B:

FORMULA B



wherein each of R^1 and R^2 is individually a divalent organic moiety which is predominately hydrocarbon, each R^3 is individually hydrogen or lower alkyl, y is a fraction from 0 to 0.5 and x is a fraction from about 0.05 to about 0.4.

6,040,064

HONEYCOMB BODY WITH THERMAL INSULATION, PREFERABLY FOR AN EXHAUST GAS CATALYTIC CONVERTER

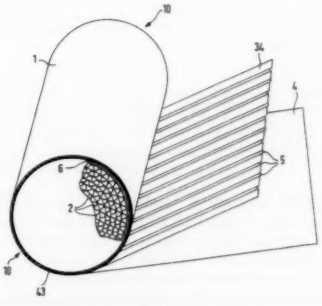
Rolf Brück, Bergisch Gladbach, and Peter Hirth, Lohmar, both of Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Continuation of application No. PCT/EP97/05098, Sep. 17, 1997. This application Apr. 5, 1999, Appl. No. 286,689.

Claims priority, application Germany, Oct. 4, 1996, 196 41 049

Int. Cl.[7] B21D *39/00*

U.S. Cl. 428—593 34 Claims



1. A honeycomb body, comprising:

a multiplicity of honeycombs; and

a thermal insulation having a plurality of at least one of stacked and wound insulating sheet layers;

said insulating sheet layers having microstructures mutually supporting said insulating sheet layers and defining interme-

diate spaces between said insulating sheet layers, said microstructures having a height of from 15 μm to 250 μm.

6,040,065

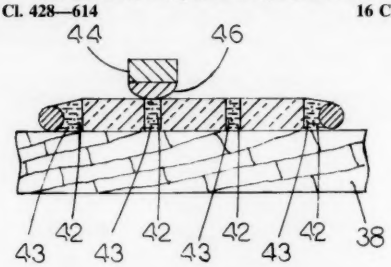
METHOD FOR PRODUCING A METAL MATRIX FOR MOSAIC STRUCTURES

Andrew Eisan, 1611 Ward St., Durham, N.C. 27707

Filed Dec. 21, 1998, Appl. No. 217,374

Int. Cl.[7] **B44C** *5/08;* **B44F** *1/06;* **B23K** *1/20*

U.S. Cl. 428—614 **16 Claims**



9. A method for building a structure comprising the steps of positioning a set of inclusions so that an interval separates adjacent inclusions, and

placing a substrate of metal fibers into said intervals, and

coating said substrate fibers and filling the spaces between said fibers with a metal infiltrate so that said substrate fibers and said infiltrate form a matrix which substantially fills said intervals, whereby said set of inclusions and said matrix are formed into a unified structure.

6,040,066

REWRITABLE OPTICAL INFORMATION MEDIUM

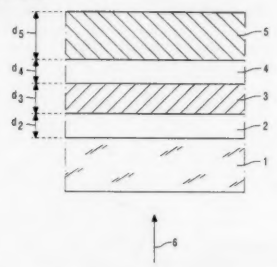
Guo-Fu Zhou; Bernardus A.J. Jacobs; Johannes C.N. Rijpers, and Hermanus J. Borg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1998, Appl. No. 206,430

Claims priority, application European Pat. Off., Dec. 11, 1997, 97203894

Int. Cl.[7] **B32B** *3/00*

U.S. Cl. 428—641 **8 Claims**



1. An optical information medium for erasable high-speed recording by means of a laser-light beam, said medium comprising a substrate carrying a stack of layers, which stack comprises, in this order, a first dielectric layer, a recording layer of a phase-change material comprising a compound consisting of Ge, Sb, Te and O, a second dielectric layer and a metal mirror layer, characterized in that

the compound has a composition $(Ge_aSb_bTe_c)_{1-d}O_d$, wherein:

$a+b+c=1$

$0.0001 \leqq d \leqq 0.035$

the first dielectric layer having a thickness of 70 to $(70+\lambda/2n)$ nm, wherein λ is the wavelength of the laser-light beam, and n is the refractive index of this layer;

the recording layer having a thickness of 10 to 35 nm;

the second dielectric layer having a thickness of 10 to 50 mn;

the metal mirror layer having a thickness of 60 to 160 nm.

6,040,067

HARD COATED COPPER ALLOYS

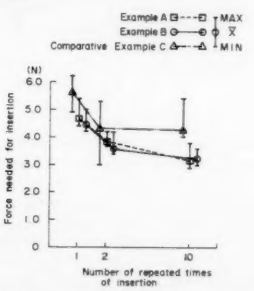
Akira Sugawara; Yoshitake Hana, both of Toyooka-mura; Takayoshi Endo, and Osamu Sugiyama, both of Shizuoka, all of Japan, assignors to Dowa Mining Co., Ltd., and Yazaki Corporation, both of Tokyo, Japan

Filed Jul. 9, 1997, Appl. No. 890,387

Claims priority, application Japan, Jul. 11, 1996, 8-201077

Int. Cl.[7] **B32B** *5/16;15/01;15/20*

U.S. Cl. 428—647 **6 Claims**



1. A coated copper alloy which comprises a copper alloy having a surface coating containing Sn, said Sn coating being formed by surface treating said copper alloy with Sn, followed by heat treating the resultant Sn coated copper alloy to cause heat diffusion so as to form a surface coating consisting essentially of Cu and Sn, said surface coating extending to a depth which includes at least the resultant interface between the Sn-containing layer and said copper alloy, said surface coating having a thickness of 1 to 5 μm, wherein the copper alloy has a composition selected from the group consisting of

(a) 4.2 wt % Zn, 0.14 wt % Fe, 1.03 wt % Sn, 0.05 wt % P, with the remainder being Cu,

(b) 4.1 wt % Zn, 0.18 wt % Fe, 1.94 wt % Sn, 0.04 wt % P, with the remainder being Cu,

(c) 4.2 wt % Zn, 7.9 wt % Sn, 0.186 wt % P, with the remainder being Cu,

(d) 4.3 wt % Zn, 0.2 wt % Mg, 0.09 wt % P, with the remainder being Cu, and

(e) 1.9 wt % Zn, 0.15 wt % Al, 0.18 wt % Cr, with the remainder being Cu.

6,040,068

CERAMIC WIRING BOARD AND METHOD OF PRODUCING THE SAME

Taka-aki Yasumoto, Kawasaki, and Hideki Yamaguchi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

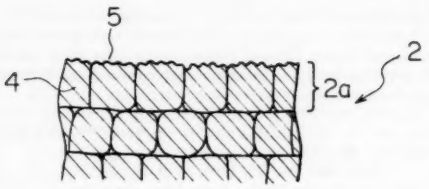
Filed Aug. 12, 1997, Appl. No. 909,740

Claims priority, application Japan, Aug. 14, 1996, 8-214628

Int. Cl.[7] **B32B** *9/00*

U.S. Cl. 428—688 **10 Claims**

1. A ceramic wiring board comprising a non-oxide based ceramic substrate, a metallized layer formed on the non-oxide based ceramic substrate, and a metal plated layer formed on the metallized layer, wherein the metallized layer has a large number of minute irregularities having a difference of elevation in a range



of about 0.5 to about 200 nm formed on a surface of metal particles forming the metallized layer, the minute irregularities consisting of peaks and valleys, the peaks being formed at intervals of about 0.5 to about 450 nm.

6,040,069

ELECTROLUMINESCENE DEVICE WITH EMISSION OF POLARIZED LIGHT

Donald Lupo, Frankfurt; Marcus Remmers, and Dieter Neher, both of Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

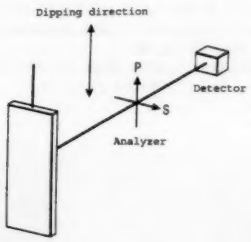
PCT No. PCT/EP96/01202, § 371 Date Sep. 18, 1997, § 102(e) Date Sep. 18, 1997, PCT Pub. No. WO96/29376, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 20, 1996, Appl. No. 913,651

Claims priority, application Germany, Mar. 20, 1995, 195 09 450

Int. Cl.[7] H05B *33/14*

U.S. Cl. 428—690 **10 Claims**



1. An electroluminescence device comprising a light-emitting layer which comprises at least one polymer, wherein the emitted electroluminescence is polarized and the polarization ratio is at least three.

6,040,070

PEROVSKITE TYPE ABO_3 WITH SURFACE LAYER

Krzysztof Szot, Kattowicz, Poland; Wolfgang Speier, and Jörg Herion, both of Jülich, Germany, assignors to Forschungszentrum Jülich GmbH, Jülich, Germany

Continuation-in-part of application No. PCT/DE96/02501, Dec. 21, 1996. This application Jul. 2, 1998, Appl. No. 109,734.

Claims priority, application Germany, Jan. 5, 1996, 196 00 218

Int. Cl.[7] B32B *9/00;* **C23C** *8/10*

U.S. Cl. 428—700 **3 Claims**

1. A substrate comprising a perovskite of the type ABO_3 having a surface layer of $AO^*(ABO_3)_n$ formed in a growth pattern parallel to the (100) surface of the ABO_3 perovskite substrate.

6,040,071

LAUNDRY CONCENTRATES

Andrea Lee Motyka, Doylestown, Pa.; Guy Broaze, Grace-Hollogne, Belgium, and Alison Kugler, South River, N.J., assignors to Colgate-Palmolive Co, New York, N.Y.

Division of application No. 08/679,747, Jul. 15, 1996, Pat. No. 5,856,287, which is a continuation of application No. 08/396,858, Mar. 1, 1995, abandoned. This application Jan. 22, 1998, Appl. No. 153,808.

Int. Cl.[7] H01J *29/74*

U.S. Cl. 428—704 **9 Claims**

1. A method for preparing a diluted laundry concentrate comprising:

a) providing a laundry concentrate composition in the form of a water-in-oil emulsion containing at least about 2% by weight water and comprising a mixture of at least one non-ionic surfactant and at least one water insoluble oil containing a polar proton sharing group and having a melting point below about 30° C., said non-ionic surfactant being the condensation product of an aliphatic alcohol having from about 6 to 26 carbon atoms with ethylene oxide, said oil being selected from the group consisting of saturated aliphatic alcohols or acids containing from about 6 to 12 carbon atoms and unsaturated liquid fatty C_{16} to C_{18} acids or alcohols, said concentrate characterized by a viscosity of at least about 10 cps; and

b) diluting said concentrate with at least one volume of water per volume of concentrate such that said concentrate is at least partially converted into a liquid crystal phase dispersion, providing a diluted concentrate having a viscosity of at least about 50 cps.

6,040,072

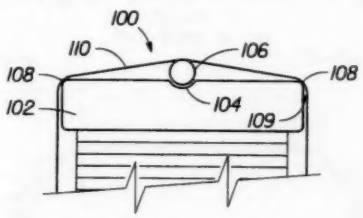
APPARATUS AND METHOD FOR COMPRESSING A STACK OF ELECTROCHEMICAL CELLS

Oliver J. Murphy; Carlos Salinas, both of Bryan, and Alan J. Cisar, Cypress, all of Tex., assignors to Lynntech, Inc., College Staton, Tex.

Filed Nov. 19, 1997, Appl. No. 974,384

Int. Cl.[7] H01M *8/24*

U.S. Cl. 429—12 **44 Claims**



1. An apparatus comprising:

an electrochemical cell stack having a plurality of components;

a banding member disposed about the cell components to secure the cell components in intimate contact; and

one or more load distributing elements disposed between the banding member and the stack.

6,040,073

FUEL CELL

Takafumi Okamoto, Koshigaya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

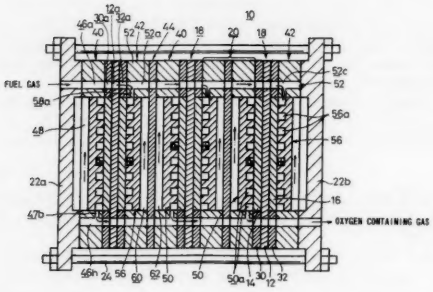
Filed Aug. 6, 1997, Appl. No. 908,154

Claims priority, application Japan, Aug. 7, 1996, 8-208512

Int. Cl.[7] H01M *8/04*

U.S. Cl. 429—26 **23 Claims**

1. A fuel cell comprising:



a plurality of fuel cell units with each fuel cell unit comprising an anode electrode and a cathode electrode facing each other with an electrolyte membrane interposed therebetween;

a separator interposed between adjacent fuel cell units; and

wherein said separator comprises, respectively disposed therein, a first cooling path through which a first cooling medium is passed for cooling said anode electrode side, and a second cooling path through which a second cooling medium is passed for cooling said cathode electrode side; and

wherein one of said first cooling medium and said second cooling medium has a lower melting point than the other cooling medium.

6,040,074

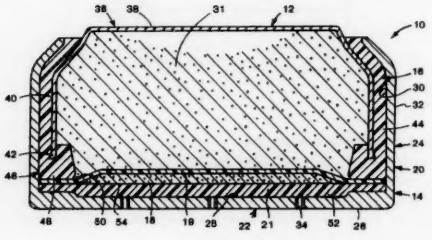
METAL-AIR CATHODE CAN, AND ELECTROCHEMICAL CELL MADE THEREWITH

Robert Adey, South Shields, United Kingdom; Robert Brian Dopp, Marietta, Ga., and John Edward Oltman, Mount Horeb, Wis., assignors to Rayovac Corporation, Madison, Wis.

Continuation-in-part of application No. 08/435,477, May 5, 1995, Pat. No. 5,733,676. This application Apr. 30, 1997, Appl. No. 846,327.

Int. Cl.[7] **H01M** *12/06*

U.S. Cl. 429—27 **46 Claims**



1. A cathode can, comprising:

(a) a bottom, having an inner surface and an outer surface;

(b) a side wall extending upwardly from said bottom; and

(c) at least two air ports extending through said bottom, between said inner surface and said outer surface,

said cathode can having an outside diameter, each said air port defining an open area thereacross corresponding to an effective diameter of the respective said air port, the ratio of the average of the effective diameters of the air ports to the outside diameter of said cathode can being no greater than 0.004/1.

6,040,075

ELECTROLYTIC AND FUEL CELL ARRANGEMENTS

Paul Leonard Adcock; Philip John Mitchell, both of Leicestershire, and Simon Edward Foster, Lancashire, all of United Kingdom, assignors to Loughborough University of Technology, Leicestershire, United Kingdom

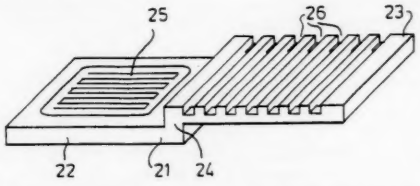
PCT No. PCT/GB95/02937, § 371 Date Jul. 31, 1997, § 102(e) Date Jul. 31, 1997, PCT Pub. No. WO96/19015, PCT Pub. Date Jun. 20, 1996

PCT Filed Dec. 15, 1995, Appl. No. 849,507

Claims priority, application United Kingdom, Dec. 17, 1994, 9425622; Dec. 17, 1994, 9425623

Int. Cl.[7] **H01M** *8/10;8/24;12/06*

U.S. Cl. 429—32 **56 Claims**



1. An arrangement suitable for redox flow cells comprising:

a stacking of bipolar elements, each element comprising:

an anode part; and

a cathode part;

the anode part of each element cooperating with the cathode part of the next adjacent element; and

an electrically insulating ion exchange material being confined between the elements.

6,040,076

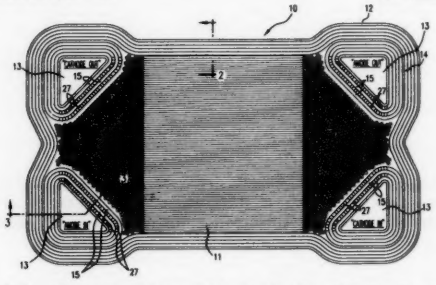
ONE PIECE FUEL CELL SEPARATOR PLATE

Kenneth W. Reeder, Hobart Lake, Ind., assignor to M-C Power Corporation, Burr Ridge, Ill.

Filed Mar. 3, 1998, Appl. No. 33,761

Int. Cl.[7] **H01M** *2/08;2/14*

U.S. Cl. 429—35 **21 Claims**



8. In a fuel cell stack comprising a plurality of fuel cell units, each said fuel cell unit comprising an anode and a cathode, an electrolyte in contact on one side with an electrolyte facing face of said anode and in contact on the opposite side with an electrolyte facing face of said cathode, and a separator plate separating said fuel cell units between an anode and cathode forming an anode chamber between an anode facing face of said separator plate and said anode and forming a cathode chamber between a cathode facing face of said separator plate and said cathode of an adjacent said fuel cell unit, said anode chamber in gas communication with a fuel gas supply and outlet and said cathode chamber in gas communication with an oxidant gas supply and outlet, said anodes, said cathodes, and said separator plates extending to the peripheral edge of said fuel cell stack, the improvement comprising:

said separator plate comprising one sheet of a material suitable for use as a separator plate, said separator plate having a centrally disposed active region and a peripheral seal struc-

ture, said peripheral seal structure sealing against an adjacent fuel cell component facing each face of said separator plate; and

said anode, said cathode, and said separator plate forming a plurality of aligned perforations, said perforations in said separator plate being surrounded by a manifold seal structure on each said face of said separator plate, said manifold seal structure sealing against said adjacent fuel cell components forming a plurality of gas manifolds extending through said fuel cell stack.

6,040,077

CATALYST FOR MEMBRANE ELECTRODE ASSEMBLY AND METHOD OF MAKING

Mark K. Debe, Stillwater; Gregory M. Haugen, Edina; Andrew J. Steinbach, St. Paul; John H. Thomas, III, Mahtomedi, all of Minn., and Raymond J. Ziegler, Glenwood City, Wis., assignors to 3M Innovative Properties Company, Saint Paul, Minn.

Continuation of application No. 08/948,910, Oct. 10, 1997, Pat. No. 5,879,827. This application Jan. 8, 1999, Appl. No. 227,610.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01M *4/86*

U.S. Cl. 429—40 **20 Claims**

1. A catalyst in a fuel cell electrode, said catalyst comprising alternating layers of catalyst material containing Pt and O and catalyst material containing Ru and O.

6,040,078

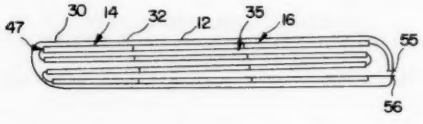
FREE FORM BATTERY APPARATUS

Denis G. Fauteux, Acton; Robert Rounds, III, Boston, and Michael Farina, Waltham, all of Mass., assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation-in-part of application No. 08/812,021, Mar. 6, 1997, Pat. No. 5,853,917. This application Oct. 26, 1998, Appl. No. 179,116.

Int. Cl.[7] H01M *6/00*

U.S. Cl. 429—48 **15 Claims**



1. A battery apparatus comprising:

a casing;

at least one stacked lithium ion cell positioned within the casing; and

means operatively associated with each of the at least one lithium ion cell for substantially precluding inadvertent deformation of the casing by the at least one lithium ion cell, during cell cycling and storage.

6,040,079

BATTERY ELECTROLYTE LEVEL INDICATOR

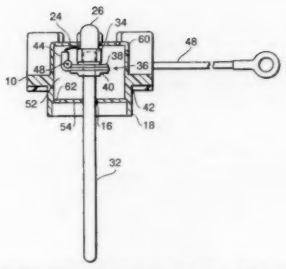
Irving B. Mcmurren, 821 Arguilla Rd., Palm Springs, Calif. 92262

Filed Aug. 28, 1997, Appl. No. 919,251

Int. Cl.[7] H01M *10/48*

U.S. Cl. 429—91 **22 Claims**

1. A self-contained battery electrolyte level indicator sized to be substituted for and mounted in place of a battery cap on a battery, said indicator comprising:



a) a cap housing having a size and shape similar to that of a battery cap so as to fit in a cell access port of the battery;

b) means for mounting the cap housing in the port of a battery cell from which a battery cap closing that cell is removed;

c) a probe extending from the cap housing into the electrolyte and being in electrically conductive relationship therewith, said probe having a length sufficient to determine if the electrolyte is at a proper level with respect to a cell of the battery;

d) an indicator light mounted on said cap adjacent to said probe and having a portion external to and extending outwardly of said cap so as to be readily observable when the battery is in use thereby avoiding the need for remotely located lights and a wiring harness; and

e) electrically conductive means in said cap connecting a terminal of said light in said cap to said probe to enable an electrical circuit to be completed to a terminal of the battery.

6,040,080

BATTERY TRAY

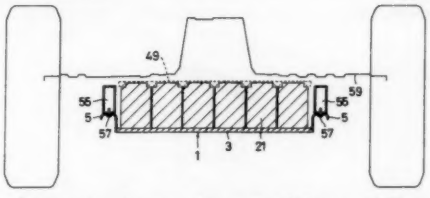
Hiromasa Minami; Masaru Igarashi, and Takahiro Chiku, all of Hamamatsu, Japan, assignors to Suzuki Motor Corporation, Hamamatsu, Japan

Filed Nov. 28, 1997, Appl. No. 980,228

Claims priority, application Japan, Nov. 27, 1996, 8-315827

Int. Cl.[7] H01M *2/02;2/10*

U.S. Cl. 429—96 **5 Claims**



1. A battery tray for supporting an electric battery, said battery tray comprising

a combined FRP member molded such that a balsa member, a metal net and fiber reinforced plastic are composite-molded with resin.

6,040,081

FLAT BATTERY ELEMENT HAVING CURVED CONTACTS

Steven Van Lerberghe, Le Mans, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1997, Appl. No. 891,339

Claims priority, application France, Jul. 10, 1996, 96 08622

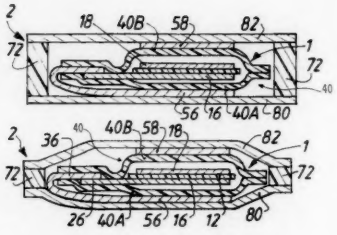
Int. Cl.[7] H01M *2/14*

U.S. Cl. 429—131 **6 Claims**

1. A flat battery element comprising:

a cell having an electrolyte and electrodes with contact zones;

conductive strips which contact said contact zones; and



an envelope having an insulating film which seals the cell and includes a passage which allow passage of said contact zones to contact said conductive strips and prevent contact of said conductive strips with said electrolyte;

said conductive strips curving over said envelope to form contact pins over said envelope;

said envelope having upper and lower walls which are sealed together at a periphery thereof except at portions forming said passage.

6,040,082

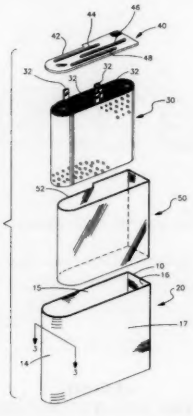
VOLUMETRICALLY EFFICIENT BATTERY FOR IMPLANTABLE MEDICAL DEVICES

David P. Haas, Brooklyn Park; William G. Howard, Roseville; Ann M. Crespi, Minneapolis; Anthony R. Rorvick, Brooklyn Park; Steven Rockow, Coon Rapids, and Andrew J. Ries, Circle Pines, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 30, 1997, Appl. No. 903,297

Int. Cl.[7] H01M *4/02*

U.S. Cl. 429—163 **32 Claims**



1. A prismatic battery case for a high current rate electrochemical cell for an implantable medical device, comprising:

a top;

a base located opposite the top;

an arcuate side extending between the top and the base;

three planar sides extending between the top and the base of the battery case, wherein the an arcuate side is located directly opposite one of the planar sides.

6,040,083

ALKALINE DRY CELL CONTAINING A CAN OF NICKEL-PLATED STEEL HAVING AN INNER SURFACE OF GRAPHITE

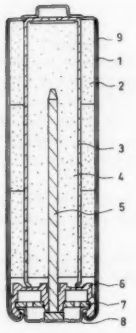
Seiichi Hikata, Annaka, and Natsuki Toyota, Takasaki, both of Japan, assignors to Toshiba Battery Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1998, Appl. No. 50,804

Claims priority, application Japan, Apr. 4, 1997, 9-086677

Int. Cl.[7] H01M *2/02*

U.S. Cl. 429—169 **12 Claims**



1. An alkaline dry cell comprising

a steel can having an inner surface comprising nickel;

a positive electrode compound inside the can; and

a conductive film on the inner surface and in contact with the positive electrode compound, wherein

the conductive film consists essentially of graphite.

6,040,084

CLOSED SECONDARY BATTERY CONTAINER

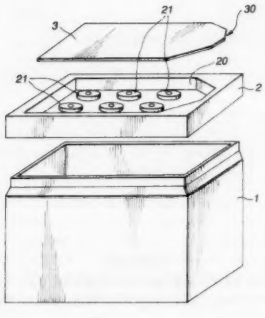
Yoshihiro Kurasawa, and Koji Nishida, both of Hiratsuka, Japan, assignors to Mitsubishi Engineering-Plastics Corporation, Japan

Filed Feb. 27, 1998, Appl. No. 31,769

Claims priority, application Japan, Mar. 7, 1997, 9-053021

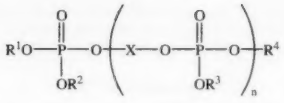
Int. Cl.[7] H01M *2/02;2/08*

U.S. Cl. 429—176 **9 Claims**



1. A closed secondary battery container comprising:

at least two container parts comprising a resin composition comprising (a) 100 parts by weight of a polyphenylene ether resin and (b) 1 to 30 parts by weight of a phosphoric ester compound represented by the following formula (1):



(1)

wherein R^1, R^2, R^3 and R^4 are independently any of C_1–C_{10} alkyl group, a C_5–C_{15} cycloakyl group, a C_6–C_{15} aryl group, a C_1–C_{10} alkyl-substituted C_6–C_{15} aryl group, a halogen-substituted C_6–C_{15} aryl group, a C_6–C_{15} aryl-substituted C_1–C_{10} alkyl group, a halogen atom or a hydrogen atom; X is an arylene group; and n is an integer not less than 1, and

an epoxy resin adhesive comprising a base resin and a curing agent, which curing agent comprises tris(dimethylaminomethyl)phenol, a salt of organic acid of tris(dimethylaminomethyl)phenol or a mixture thereof,

said parts being bonded together through said adhesive.

6,040,085

BATTERY PACKAGING

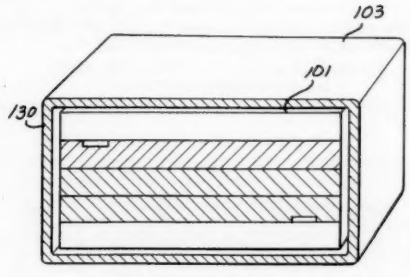
S. Scot Cheu, and Russell D. Moulton, both of San Jose, Calif., assignors to Valence Technology, Inc., Henderson, Nev.

Continuation-in-part of application No. 08/221,437, Mar. 31, 1994, Pat. No. 5,670,272. This application Mar. 4, 1997, Appl. No. 811,146.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H01M** *6/12*

U.S. Cl. 429—185 **30 Claims**



1. A battery package comprising:

a laminar battery having an anode layer, a cathode layer, and a separator layer between the anode and cathode layers; and

a layer of heat shrink material surrounding and in contact with at least one of said layers of the laminar battery, the heat shrink material having been heated to apply compressive force to enhance physical contact between the anode layer, separator layer, and cathode layer.

6,040,086

NONAQUEOUS ELECTROLYTE SECONDARY BATTERY

Hiroaki Yoshida; Zenzo Hagiwara, and Masanao Terasaki, all of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1998, Appl. No. 48,785

Int. Cl.[7] **H01M** *2/26;10/04*

U.S. Cl. 429—211 **7 Claims**

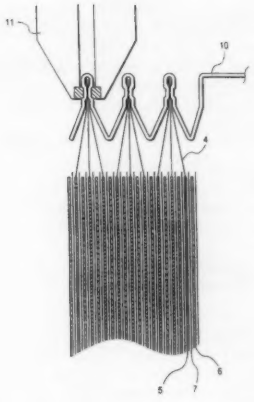
1. A nonaqueous electrolyte secondary battery comprising:

a power-generating element having a positive electrode, a negative electrode and a separation body, said power-generating element being provided with a portion where said negative electrode and said positive electrode are not opposed to each other, said positive and negative electrodes being wound or laminated through said separation body so that side edge portions of each of said electrode plates protrude from that of the other; and

a collector connected to the side edge portion, said collector having a plurality of grooves bonded to the side edge portions of said negative and positive electrode plates, wherein

said collector has a guide portion through which bundled groups of said side edge portions are introduced into said grooves, and further wherein

said bonding is made by at least one of a welding method and a mechanical joint.



6,040,087

POWDERY MATERIAL, ELECTRODE MEMBER, AND METHOD FOR MANUFACTURING SAME FOR A SECONDARY CELL

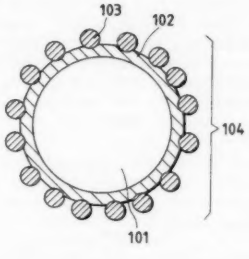
Soichiro Kawakami, Nara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1997, Appl. No. 999,136

Claims priority, application Japan, Dec. 27, 1996, 8-349530; Jan. 29, 1997, 9-015331

Int. Cl.[7] **H01M** *4/58*

U.S. Cl. 429—218.1 **103 Claims**



1. A powdery material having a function of storing and releasing hydrogen, comprising a compound which electrochemically stores and releases hydrogen, said powdery material having a structure of at least three layers comprising:

a core of a hydrogen-storing alloy;

a metal oxide layer provided on the surface of said core and having a function of preventing the oxidation of the alloy and allowing atomic hydrogen or hydrogen ions to pass therethrough; and

a metal element dispersed on the surface of said metal oxide layer and having a function of activating hydrogen.

6,040,088

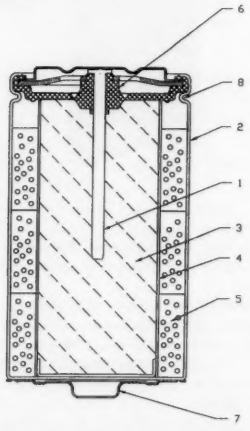
SODIUM POLYACRYLATE GELLING AGENT FOR ZINC GELLED ANODE

Patricia S. Bennett, Madison; Kenneth H. Kenyon; Ronald J. Ekern, both of Verona; Janna L. Rose, and Josie B. Wieser, both of Madison, all of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Apr. 15, 1997, Appl. No. 837,405

Int. Cl.[7] H01M *4/24*

U.S. Cl. 429—229 **26 Claims**



1. A gelled anode for use in an alkaline electrochemical cell, the gelled anode comprising:

an aqueous alkaline electrolyte;

a zinc powder; and

a gelling agent consisting essentially of a single sodium polyacrylate superabsorbent polymer characterized as a white, free flowing granular powder having a typical bulk density of 0.75, a free swell capacity of greater than 180 grams of saline solution per gram, a maximal moisture content of 5%, 200 or fewer ppm of residual acrylate monomer, and a particle size distribution of between 90 and 850 microns.

6,040,089

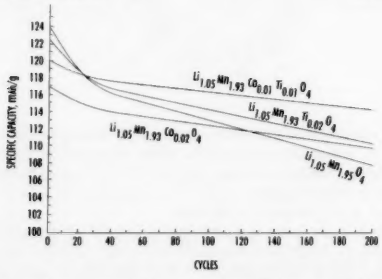
MULTIPLE-DOPED OXIDE CATHODE MATERIAL FOR SECONDARY LITHIUM AND LITHIUM-ION BATTERIES

Vesselin Manev; Titus Faulkner, both of Gastonia; Wayne Barnette, Bessemer City, all of N.C., and Yuan Gao, Ocean, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Provisional application No. 60/039,666, Feb. 28, 1997. This application Feb. 27, 1998, Appl. No. 31,849.

Int. Cl.[7] H01M *4/50*

U.S. Cl. 429—231.1 **18 Claims**



1. A positive electrode for secondary lithium and lithium-ion batteries comprising a multiple-doped lithium manganese metal oxide with a spinel structure and described by the general formula:

$$Li_{1+X}Mn_{2-Y}M_{m_1}{}^{1}M_{m_2}{}^{2} \ldots M_{m_k}{}^{k}O_{4+Z}$$

wherein M^1, M^2, . . . M^k are at least two different cations other than lithium or manganese, selected from the group consisting of alkali metals, alkaline earth metals, transition metals, B, Al, Si, Ga and Ge;

X, Y, m_1, m_2, . . . m_k are between 0 and 0.2;

m_1, m_2 and Y are greater than 0;

Z is a number between −0.1 and 0.2; and

wherein m_1, m_2, . . . m_k satisfy the following equation and inequality:

$$Y = X + m_1 + m_2 + \cdots + m_k$$

and

$$3.3 < \frac{m_1V_1 + m_2V_2 + \cdots + m_kV_k}{m_1 + m_2 + m_3 + \cdots + m_k} < 3.7$$

wherein V_1, V_2, . . . V_k are the corresponding valence states of the cations M^1, M^2, . . . M^k.

6,040,090

POSITIVE ELECTRODE MATERIAL FOR USE IN NON-AQUEOUS ELECTROLYTE BATTERY, PROCESS FOR PREPARING THE SAME, AND NON-AQUEOUS ELECTROLYTE BATTERY

Takuya Sunagawa; Hiroshi Watanabe, both of Hirakata; Ryuji Ohshita, Neyagawa; Masahisa Fujimoto, Osaka; Toshiyuki Nohma, and Koji Nishio, both of Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

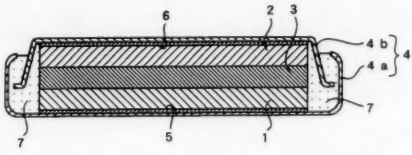
Filed Apr. 14, 1998, Appl. No. 59,701

Claims priority, application Japan, Apr. 15, 1997, 9-097239; May 8, 1997, 9-117341; Aug. 27, 1997, 9-230145

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01M *4/48;4/50;4/52*

U.S. Cl. 429—231.95 **18 Claims**



1. A positive electrode material for use in a non-aqueous electrolyte battery comprising a lithium-metal compound oxide containing at least Ni, Co and Mn and in addition, M, which denotes at least one element selected from the group consisting of B, Al, Si, Fe, V, Cr, Cu, Zn, Ga and W, the lithium-metal compound oxide having a peak with a full width at half maximum of not greater than 0.22° in a range of 2θ=18.71±0.25°, as measured by the powder X-ray diffraction analysis using a Cu-Kα X-ray source.

6,040,091

LITHIUM ION SECONDARY CELL SOLVENT

Hiroaki Sugita, Susono, and Hisashi Yamamoto, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

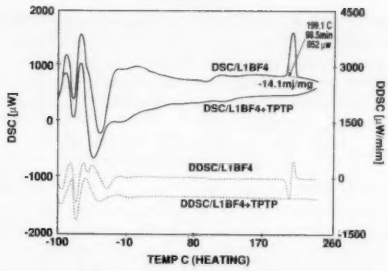
Filed Jun. 29, 1998, Appl. No. 106,268

Claims priority, application Japan, Jul. 10, 1997, 9-185373

Int. Cl.[7] H01M *6/04*

U.S. Cl. 429—324 **4 Claims**

1. A lithium ion secondary cell solvent characterized in that a thiophosphate type flame retardant represented by $(R_1S)_3P{=}O$,



wherein R1 is aryl, alkaryl, or aralkyl, is added to a non-aqueous solvent.

6,040,092

NONAQUEOUS SECONDARY BATTERY

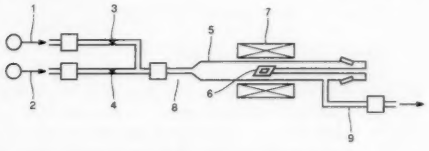
Kazuo Yamada, Kitakatsuragi-gun; Takehito Mitate, Yamatotakada; Naoto Nishimura, Kitakatsuragi-gun; Yoshihiro Tsukuda, and Kazuaki Minato, both of Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1996, Appl. No. 772,255

Claims priority, application Japan, Dec. 25, 1995, 7-336697; Dec. 6, 1996, 8-326371

Int. Cl.[7] H01M *10/40;6/16;4/58*

U.S. Cl. 429—331 **14 Claims**



1. A nonaqueous secondary battery comprising:

a negative electrode including graphite particles coated with carbon having a lower crystallinity than graphite, wherein at least a portion of said graphite particles are only partially coated with said carbon having a lower crystallinity than graphite, and a nonaqueous electrolyte, said electrolyte comprising ethylene carbonate (EC) and propylene carbonate (PC).

6,040,093

METHOD AND TRANSFERRING CONDUCTOR PATTERNS TO A FILM CARRIER, AND MASKS AND FILM CARRIERS TO BE USED THEREFOR

Hideki Yuzawa, Nagano-ken, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP97/01889, § 371 Date Apr. 20, 1998, § 102(e) Date Apr. 20, 1998, PCT Pub. No. WO97/50121, PCT Pub. Date Dec. 31, 1997

PCT Filed Jun. 4, 1997, Appl. No. 29,357

Claims priority, application Japan, Jun. 25, 1996, 8-165001

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **20 Claims**

8. A method of transferring a conductor pattern for BTAB to a film carrier for mounting an electronic device comprising:

coating photoresist on one surface of the film carrier, another surface of the film carrier having a film defining an aperture and a conductor layer covering the film;

transferring, preliminarily, a pattern of a first mask for the one surface, the pattern including a conductor pattern forming pattern and two or more positioning marks, and a pattern of a second mask for the other surface, the pattern of the second mask including a conductor pattern forming pattern and positioning marks that are in mating relation with the positioning marks transferred from the first mask;

measuring deviations between a position of the transferred positioning marks for the one surface with respect to the reference coordinates of the film carrier and a designed position;

measuring deviations between a position of the transferred positioning marks for the other surface with respect to the deviations measured for the one surface;

adjusting a position of the first mask and the second mask with respect to the film carrier based on the deviations; and

transferring the first and second mask patterns to the one surface and the other surface of the film carrier, respectively.

6,040,094

MASK FOR PILING PROCESS, MASK-PRODUCING METHOD, AND MASK-EMPLOYING METHOD

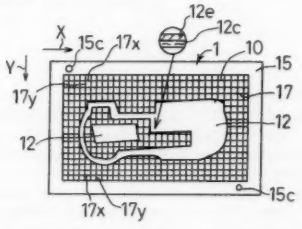
Yukio Otsuka, Aichi-ken, and Motoaki Ozaki, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 24, 1998, Appl. No. 65,615

Claims priority, application Japan, Apr. 25, 1997, 9-109115; Feb. 27, 1998, 10-047649

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **26 Claims**



1. A mask for use in a piling process for producing a three-dimensional laminated object by piling a plurality of solid layers each formed by receiving energy emitted from an emitting source, said mask comprising:

(a) a mask portion having

(i) a bed sheet layer having a designated pattern shape and having an irradiation side; and

(ii) an irradiation-resistant layer for interrupting said emitted energy and being coated on said irradiation side of said bed sheet layer and having a greater durability with respect to said emitted energy than that of said bed sheet layer; and

(b) a support for holding said mask portion, said support having one or more openings which allow emitted energy to pass through said one or more openings.

6,040,095

MEASUREMENT MARKS FOR E-BEAM PROJECTION MASK AND METHOD OF USING

William A. Enichen, Poughkeepsie, and Christophe F. Robinson, Hyde Park, both of N.Y., assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 30, 1998, Appl. No. 163,406

Int. Cl.[7] G03F *9/00*

U.S. Cl. 430—5 **17 Claims**

1. A charged particle beam projection mask including:

a plurality of patterned sub-field membrane mask areas,

a grillage of struts extending between and supporting said membrane mask areas, and

a plurality of measurement marks corresponding in number to said plurality of said sub-field membrane mask areas and located on said grillage of struts adjacent to said sub-field membrane mask areas and formed concurrently with patterning of said sub-field membrane mask areas in the same process.

6,040,096

MASK SUBSTRATE, PROJECTION EXPOSURE APPARATUS EQUIPPED WITH THE MASK SUBSTRATE, AND A PATTERN FORMATION METHOD UTILIZING THE PROJECTION EXPOSURE APPARATUS

Yukio Kakizaki, Kanagawa-ken; Toru Kiuchi, Higashi-kurume-si; Kesayoshi Amano, and Toshikazu Umatate, both of Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

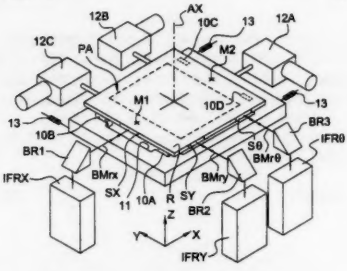
Division of application No. 08/734,544, Oct. 21, 1996, Pat. No. 5,894,056. This application Dec. 31, 1998, Appl. No. 224,061.

Claims priority, application Japan, Dec. 19, 1995, 7-330542

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *9/00;* **G03B** *27/42;* **G01B** *11/00*

U.S. Cl. 430—5 **35 Claims**



1. A method for forming a pattern onto a substrate by an exposing operation in which illumination light is illuminated on a pattern area formed on a mask to expose a pattern image in the pattern area onto a shot area on the substrate, the method comprising the steps of:

positioning the mask on an object plane side of a projection system so as to allow for free expansion of the mask; and

detecting a displacement of the mask, the displacement being caused by illumination of the mask during the repeating exposure operations using the mask.

6,040,097

SOLUTION FOR MAKING PHOTOCONDUCTIVE LAYER AND AN ELECTROPHOTOGRAPHIC MANUFACTURING METHOD OF THE LAYER IN CRT

Sang Youl Yoon, Kyungsangbuk-do, and Ho Seok Shon, Seoul, both of Rep. of Korea, assignors to Orion Electric Co., Ltd., Kyungsangbuk-do, Rep. of Korea

PCT No. PCT/KR96/00276, § 371 Date Jul. 30, 1998, § 102(e) Date Jul. 30, 1998, PCT Pub. No. WO98/24110, PCT Pub. Date Jun. 4, 1998

PCT Filed Dec. 30, 1996, Appl. No. 117,481

Claims priority, application Rep. of Korea, Nov. 30, 1996, 96-60205; Nov. 30, 1996, 96-60206

Int. Cl.[7] G03G *5/06*

U.S. Cl. 430—28 **6 Claims**

1. A solution for forming a photoconductive layer for electrophotographically manufacturing a luminescent screen on an interior surface of a faceplate panel for a CRT created by coating the interior surface of the faceplate panel with a volatilizable conductive layer and an overlying volatilizable photoconductive layer, establishing a substantially uniform electrostatic charge over the whole area of the inner surface of the photoconductive layer, exposing selected areas of the of the photoconductive layer to discharge the charge from the selected areas, developing one of the charged, unexposed areas and the discharged, exposed areas with one of charged phosphor particles and light-absorptive material particles, depending upon the polarity of the charged particles, the solution comprising:

2–5% by weight of tetraphenyl ethylene as an ultraviolet-sensitive donor material; and

0.1–1% by weight of diphenylpicrylhydrazine.

6,040,098

SOLUTION SQUARYLIUM CHARGE GENERATION SYSTEMS INCORPORATING BINDER BLENDS

David Glenn Black, Longmont; Garry Dale Hinch, Superior; Dat Quoc Nguyen, Platteville, and Kasturi Rangan Srinivasan, Longmont, all of Colo., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Nov. 20, 1998, Appl. No. 196,211

Int. Cl.[7] G03G *5/047*

U.S. Cl. 430—59.6 **26 Claims**

1. A charge generation layer, comprising a binder and a charge generation compound, wherein the binder comprises a blend of methyl bisphenol A and an additional resin comprising an epoxy resin, a poly(phenylglycidyl ether)-co-dicyclopentadiene resin, a phenoxy resin or a polyhydroxystyrene resin.

6,040,099

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Nobuyuki Hanami, Matsudo; Junichi Kishi, Tokyo; Yoichi Kawamorita, Yokohama, and Takao Soma, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of application No. 08/234,554, Apr. 28, 1994, abandoned. This application Jan. 11, 1996, Appl. No. 584,714.

Claims priority, application Japan, Apr. 30, 1993, 5-124817

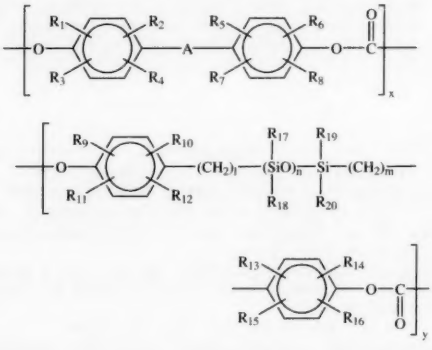
Int. Cl.[7] G03G *5/147;5/05*

U.S. Cl. 430—66 **7 Claims**

1. An electrophotographic photosensitive member comprising, in sequence:

(a) an electroconductive support; and

(b) a photosensitive layer wherein an outer surface of said photosensitive member contains a binder resin, a silicon denatured polycarbonate copolymer present in amounts from 1 to 30% by weight based on the weight of said binder resin and a silicon-containing graft polymer present in amounts from 0.02 to 10% by weight based on the weight of solids in the outer surface, wherein said silicon denatured polycarbonate copolymer has a structure of the following formula (I):



wherein A is a straight chain, branched chain or cyclic alkylidene group, an aryl-substituted alkylene group, a substituted or unsubstituted arylene group, —O—, —S—, —SO—, —SO_2—, or —CO—, R_1 to R_{16} are hydrogen atoms, halogen atoms, substituted or unsubstituted alkyl groups, or substituted or unsubstituted aryl groups, R_{17} to R_{20} are substituted or unsubstituted alkyl groups or substituted or unsubstituted phenyl groups, l, m and n are integers larger than 1, and the sum of X and Y is 100 wherein X:Y is from 99.5:0.5 to 10:90 and wherein said silicon-containing graft polymer includes, as a component thereof, a polymerizable monomer incorporating a side chain having a silicon atom.

6,040,100

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC APPARATUS

Masato Tanaka, Shizuoka-ken; Hideyuki Takai, Yokohama, and Kouichi Nakata, Numazu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1999, Appl. No. 261,504

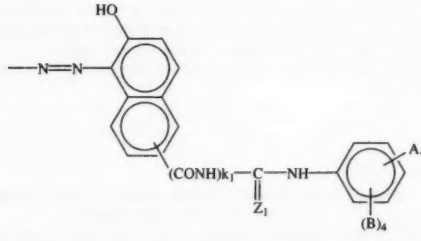
Claims priority, application Japan, Mar. 4, 1998, 10-067690; Mar. 4, 1998, 10-067691

Int. Cl.[7] G03G *5/06*

U.S. Cl. 430—72 **17 Claims**

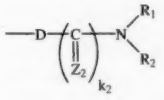
1. An electrophotographic photosensitive member, comprising a support, and a photosensitive layer disposed on the support; said photosensitive layer containing an azo pigment having an organic group represented by formula (1) below:

(1)



wherein each B independently denotes a hydrogen atom, halogen atom, nitro group, cyano group, substituted or unsubstituted alkyl group, substituted or unsubstituted alkoxy group, or substituted or unsubstituted amino group; Z_1 denotes an oxygen or sulfur atom; k_1 is 0 or 1; A denotes a residue group of formula (1A) below:

(IA)



wherein R_1 and R_2 independently denote a hydrogen atom, a substituted or unsubstituted alkyl group, substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, or a group forming a substituted or unsubstituted cyclic group by a combination of the groups R1 and R2 together with the nitrogen (N) atom in the formula (1A); Z_2 denotes an oxygen atom or sulfur atom; k_2 is 1 or 2; D denotes a substituted or unsubstituted alkylene group, substituted or unsubstituted alkenylene group or —$(CONH)_{k3}$—; and k_3 is 0 or 1.

6,040,101

CARRIER PARTICLES FOR USE IN ELECTROSTATIC IMAGE DEVELOPMENT AND ELECTROSTATIC IMAGE DEVELOPER

Akio Naka, Takatsuki; Tetsuya Yamamoto, Suita, and Yoshikuni Mori, Takatsuki, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Jun. 9, 1997, Appl. No. 871,578

Claims priority, application Japan, Jun. 10, 1996, 8-147386

Int. Cl.[7] G03G *9/113*

U.S. Cl. 430—108 **29 Claims**

1. A carrier particle for use in electrostatic image development including a core and a coating layer formed on the surface of the core, wherein the coating layer is made of a coating material comprising:

(A) an polyethyleneimine having two or more functional amino groups, with the proviso that the polyethyleneimine does not contain an $Si(OR^1)$ group, where R^1 is a hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or an acyl group;

(B) a silane compound and/or a hydrolytic condensation product thereof, having a functional group selected from the group consisting of an epoxy group and a mercapto group, wherein said functional group is reactive with the functional amino groups of the polyethyleneimine (A), and an $Si(OR^1)$ group, where R^1 is a hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or an acyl group;

(C) an organometallic compound of the formula (C) and/or a hydrolytic condensation product thereof:

$$R^2{}_mM(OR^3)_n \qquad (C)$$

wherein M is Si or a metal element; R^2 is the same or different hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or an allyl group; R^3 is the same or different hydrogen atom, a lower allyl group containing 1 to 4 carbon atoms or an acyl group; m is 0 or a positive integer; n is an integer of 1 or more; and (m+n) is equal to the valency of element M; and

(D) a solvent.

5. An electrostatic image developer comprising the carrier particle of claim **1** and toner particles.

6,040,102

ELECTROSTATIC LATENT IMAGE DEVELOPER AND IMAGE FORMING METHOD

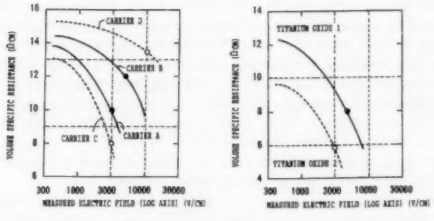
Sakon Takahashi; Shinpei Takagi; Noriyuki Mizutani; Yasuhiro Oya, and Haruhide Ishida, all of Minami-Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1997, Appl. No. 982,301

Claims priority, application Japan, Dec. 5, 1996, 8-325136

Int. Cl.[7] G03G *9/113*

U.S. Cl. 430—108 **19 Claims**



1. An electrostatic latent image developer including a toner, which is formed from an outer additive and non-magnetic resin particles containing a binder resin and a coloring agent, and a carrier, in which a resin coating layer in which electroconductive fine powder is dispersed in a matrix resin is formed on a core material, wherein the amount of coating resin of said resin coating layer is not less than 1.0 part by weight based on 100 parts of the core material, and wherein a volume specific resistivity of said carrier is greater than or equal to 10^9 Ω·cm at an electric field strength of 10000 V/cm, said outer additive contains titanium oxide whose volume specific resistivity of a compression-molded molded product is greater than or equal to 10^6 Ω·cm at an electric field strength of 3000 V/cm and is less than or equal to 10^{10} Ω·cm at an electric field strength of 10000 V/cm, and a volume specific resistivity of said electrostatic latent image developer when a toner concentration is greater than or equal to 2% is greater than or equal to 10^{11} Ω·cm at an electric field strength of 3000 V/cm; and

wherein the amount of the coating resin of said resin-coating layer is not more than 15 parts by weight based on 100 parts by weight of the core material.

6,040,103

TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND IMAGE FORMING METHOD

Manabu Ohno, Numazu; Takeshi Ohtake, Shizuoka-ken; Satoshi Matsunaga, Mishima, and Tadashi Doujo, Numazu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1997, Appl. No. 921,565

Claims priority, application Japan, Sep. 2, 1996, 8-248482; Oct. 9, 1996, 8-268354

Int. Cl.[7] G03G *9/097;13/22*

U.S. Cl. 430—110 **62 Claims**

1. A toner for developing an electrostatic image, comprising: toner particles each containing at least a binder resin, a colorant, and a wax having a branched structure and a methyl group at terminals of chains of the wax;

wherein the wax satisfies conditions of:

(a) showing a maximum heat-absorption peak in a region of 50–130° C. on temperature increase on a DSC (differential scanning calorimeter) curve, and

(b) giving a ^{13}C-NMR (nuclear magnetic resonance) spectrum showing a total peak area S in a range of 0–50 ppm, a total peak area S1 in a range of 36–42 ppm and a total peak area S2 in a range of 10–17 ppm satisfying:

$$1.0 \leqq (S1/S) \times 100 \leqq 10,\ 1.5 \leqq (S2/S) \times 100 \leqq 15, \text{ and } S1 < S2.$$

6,040,104

ELECTROPHOTOGRAPHIC TONER, ELECTROPHOTOGRAPHIC DEVELOPER, AND IMAGE FORMING METHOD

Masaki Nakamura, and Satoshi Yoshida, both of Minami-Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1998, Appl. No. 184,978

Claims priority, application Japan, Nov. 6, 1997, 9-304224; Oct. 19, 1998, 10-297366

Int. Cl.[7] G06G *9/097;9/087*

U.S. Cl. 430—110 **20 Claims**

1. An electrophotographic toner comprising a binding resin and a coloring agent, wherein said binding resin includes a resin in which the minimum value of tan δ of said binding resin is between the glass transition temperature (Tg) and a temperature at which the loss modulus (G") is 1×10^4 Pa, said minimum value of tan δ is less than 1.2, the storage modulus (G') at a temperature at which tan δ is a minimum is 5×10^5 Pa or more, and the value of tan δ is 3.0 or more at a temperature at which G"=1×10^4 Pa.

6. An electrophotographic toner according to claim **1**, comprising a binding resin and a coloring agent, wherein

said resin is a polyester resin, and the content of said polyester resin based on the total weight of the whole binding resin is 70% by weight or more, and

a vinyl-based resin having a weight-average molecular weight (Mw) of 100000 or less is contained in an amount of 20% by weight or less based on the total weight of the whole binding resin.

6,040,105

ELECTROPHOTOGRAPHIC PHOTORECEPTOR, AND A PRODUCTION METHOD OF THE SAME

Tatsuo Nakanishi, Hachioji; Shinichi Hamaguchi, Hino, and Eiichi Kijima, Hachioji, all of Japan, assignors to Konica Corporation, Japan

Filed Jun. 22, 1998, Appl. No. 102,303

Claims priority, application Japan, Jun. 26, 1997, 9-170452

Int. Cl.[7] G03G *5/10*

U.S. Cl. 430—127 **5 Claims**

1. A method of preparation of an electrophotographic photoreceptor comprising cleaning a support by applying a cleaning agent to a surface of said support and providing a photosensitive layer on the surface of the cleaned support,

said cleaning agent including an aqueous liquid containing a surface active agent comprising Si and Na and having a pH of 9.5 to 13.0, an amount of said Si and said Na remaining on said surface which, when evaluated in terms of ESCA, satisfies the following relationship with respect to aluminum or nickel constituting a major element of said support;

$$0 < [Si(surf)/Xs - Si(bulk)/Xb] \leqq 0.5$$

$$0 < [Na(surf)/Xs - Na(bulk)/Xb] \leqq 0.3,$$

wherein

Si(surf): ESCA measurement of silicon of said support surface after said cleaning

Na(surf): ESCA measurement of sodium of said support surface after said cleaning

Si(bulk): ESCA measurement of silicon of support bulk

Na(bulk): ESCA measurement of sodium of said support bulk

Xs: ESCA measurement of nickel or aluminum of said support surface after said cleaning of said support surface

Xb: ESCA measurement of nickel or aluminum of said support bulk.

6,040,106

POROUS PHOTORECEPTOR AND METHOD FOR MANUFACTURING THE SAME

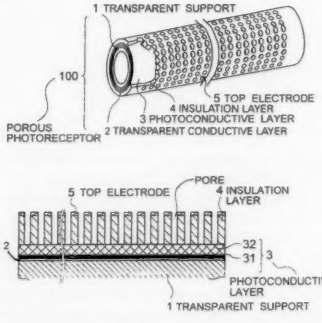
Takeshi Hori; Tsutomu Uezono; Tomoyuki Yoshii, and Yasuhiro Funayama, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 15, 1999, Appl. No. 267,678

Claims priority, application Japan, Mar. 16, 1998, 10-065790

Int. Cl.[7] G03G *5/04*

U.S. Cl. 430—127 **11 Claims**



1. A method for manufacturing a porous cylindrical photoreceptor drum comprising the steps of:

forming a cylindrical photoreceptor drum by

forming a transparent conductive layer on a transparent cylindrical support member, and

forming a heterogenous multilayer conductive particle receiving layer on the transparent conductive layer;

rotating the cylindrical photoreceptor drum around an axis along a centerline of the drum;

placing a moving mask pattern having pre-determined holes in momentary intimate contact with a circumferential contact surface of the rotating cylindrical photoreceptor drum, wherein the instantaneous relative velocity between the moving mask pattern and the rotating cylindrical photoreceptor drum is zero along the circumferential contact surface; and

forming pores in the heterogenous multilayer conductive particle receiving layer by jet-blasting minute particles through the pre-determined holes in the moving mask pattern along the circumferential contact surface and into the rotating heterogenous multilayer conductive particle receiving layer.

6,040,107

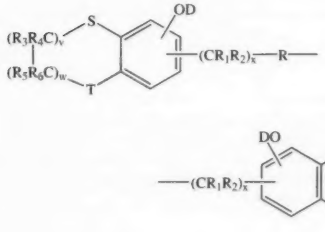
PHOTOSENSITIVE DIAZONAPHTHOQUINONE ESTERS BASED ON SELECTED CYCLIC ALKYL ETHER-CONTAINING PHENOLICS AND THEIR USE IN RADIATION SENSITIVE MIXTURES

Andrew J. Blakeney, Seekonk, Mass.; Arturo N. Medina, Scotch Plains, N.J.; Medhat A. Toukhy, Barrington, R.I.; Lawrence Ferreira, Fall River, Mass.; Alfred T. Jeffries, III, Providence, and Ahmad A. Naiini, Warwick, both of R.I., assignors to Olin Microelectronic Chemicals, Inc., Norwalk, Conn.

Filed Feb. 6, 1998, Appl. No. 19,958
Int. Cl.[7] **G03F** *7/023*
U.S. Cl. 430—165 **7 Claims**

1. A photosensitive compound comprising at least one o-quinonediazide sulfonic acid ester of a phenolic compound, said esters selected from the group consisting of formula II:

(II)



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of H and a lower alkyl group having 1–4 carbon atoms;

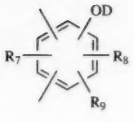
v and w are each an integer from 0 to 2 with the proviso that v and w cannot simultaneously be 0;

each S and T are independently selected from the group consisting of oxygen and —CH_2—, with the proviso that S and T cannot simultaneously be —CH_2—;

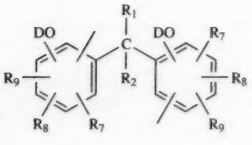
x is an integer from 1–4;

R is a bivalent alkali-soluble moiety selected from the formulae (A'), (B'), (C'), (D'), and (E'):

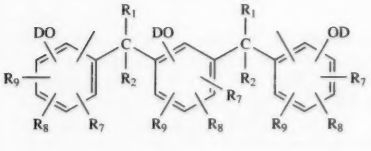
(A')



(B')



(C')



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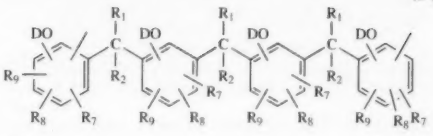
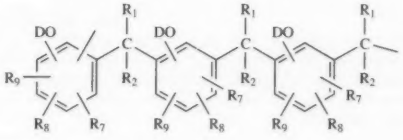
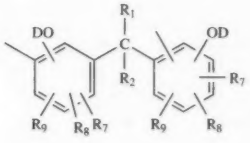
(D')



and

(E')





wherein R_7, R_8, and R_9 are each independently selected from the group consisting of hydrogen, lower alkyl groups having 1–4 carbon atoms, araalkyl and cycloalkyl; and

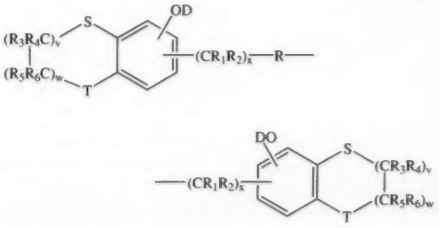
OD is hydrogen or an o-quinonediazide sulfonic acid ester group subject to the proviso that not all Ds are hydrogen and at least about 75% of the hydroxyl groups on said phenolic rings having the cyclic ether moieties are esterified with an o-quinonediazide sulfonic acid moiety, and less than about 25% of the hydroxyl groups on phenolic rings having no cyclic ether moieties are esterified.

4. A radiation sensitive mixture, said mixture comprising an admixture of:

(1) an alkali-soluble resin; and

(2) at least one photosensitive composition comprising at least one o-quinonediazide sulfonic acid ester of a phenolic compound, said ester selected from the group consisting of formula II:

(II)



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are each independently selected from the group consisting of H and a lower alkyl group having 1–4 carbon atoms;

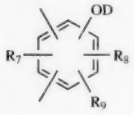
v and w are each an integer from 0 to 2 with the proviso that v and w cannot simultaneously be 0;

each S and T are independently selected from the group consisting of oxygen and —CH_2— with the proviso that S and T cannot simultaneously be —CH_2—;

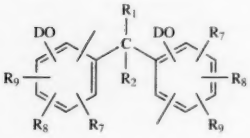
x is an integer from 1–4;

R is a bivalent alkali-soluble moiety selected from the formulae (A'), (B'), (C'), (D'), and (E'):

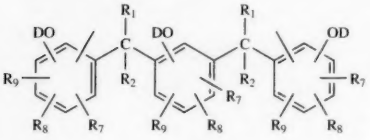
(A')



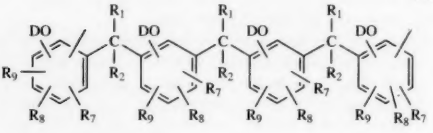
(B')



(C')

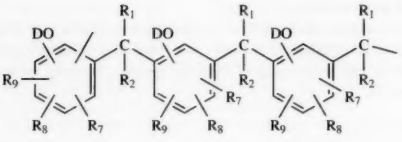


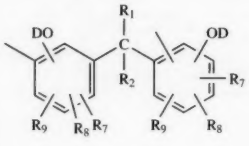
(D')



and

(E')





wherein R_7, R_8, and R_9 are independently selected from the group consisting of hydrogen, lower alkyl groups having 1–4 carbon atoms, araalkyl and cycloalkyl; and

OD is either hydrogen or an o-quinonediazide sulfonic acid ester group subject to the proviso that not all Ds hydrogen and at least about 75% of the hydroxyl groups on said phenolic rings having the cyclic ether moieties are esterified and an o-quinonediazide sulfonic acid moiety, and less than about 25% of the hydroxy groups on phenolic rings having no cyclic ether moieties are esterified.

6,040,108

COMPOSITIONS FOR MAKING STRUCTURED COLOR IMAGES AND APPLICATION THEREOF

Ulrich Schädeli, Plasselb; John S. Zambounis, Murten; Abul Iqbal, Arconciel; Zhimin Hao, Marly, and Henri Dubas, Basel, all of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of application No. 08/341,721, Nov. 18, 1994, Pat. No. 5,879,855. This application Dec. 3, 1998, Appl. No. 204,190.

Claims priority, application Germany, Nov. 22, 1993, 93 810 807

Int. Cl.[7] **G03C** *8/02;5/16;* **B41J** *2/315;* **B05D** *3/06*

U.S. Cl. 430—200 **10 Claims**

1. A method for producing colored patterns or images including the steps of

(1) forming a polymer layer containing a dissolved pigment precursor component (a), a polymer or a natural or synthetic resin material (b') and optionally a catalyst for pigment formation (c), and

(2) locally regenerating the pigment from the above soluble precursor by chemical, photolytical or thermal means, or by laser or other sources of irradiation,

wherein said pigment precursor (a) is represented by formula

$$A(B)x \qquad (I),$$

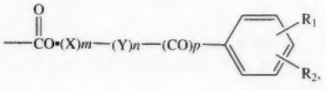
wherein

x is a number from 1 to 4,

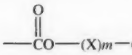
A is the residue of a colorant of the quinacridone-, anthraquinone-, perylene-, quinophthalone-, isoindolinone-, isoindoline-, dioxazine-, or azo series, which is linked to x groups B via N atoms, which nitrogens are part of A,

B is represented by formulae

(II)

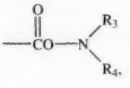


(III)



or

(IV)



and wherein in formulae II, III and IV

m, n and p are each independently of the other 0 or 1,

X is C_1–C_4-alkylene or C_2–C_8-alkenylene,

Y is a group —T—$(CH_2)_q$—,

Z is a group —T—$(CH_2)_r$—,

T is C_3–C_6-cycloalkylene,

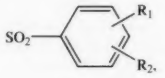
q is a number between 1 and 6,

r is a number between 0 and 6,

R_1 and R_2 are each independently of the other hydrogen, C_1–C_6-alkyl, C_1–C_4-alkoxy, halogen, CN, NO_2, phenyl or phenoxy which are unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

Q is hydrogen, CN, $Si(R_1)_3$, a group $C(R_5)(R_6)(R_7)$, wherein R_5, R_6 and R_7 are each independently of the other hydrogen or halogen and at least one of the residues R_5, R_6 and R_7 is halogen,

a group



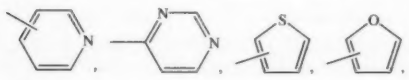
wherein

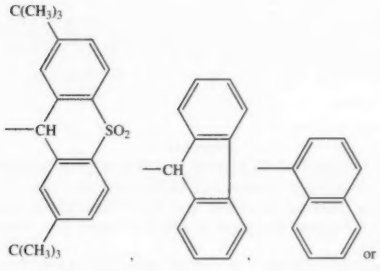
R_1 and R_2 have the same meaning as given above,

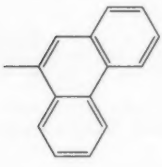
a group SO_2R_8 or SR_8, wherein R_8 is C_1–C_4-alkyl,

a group $CH(R_9)_2$, wherein R_9 is phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4 -alkoxy or halogen, or

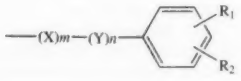
a group of formula







and R_3 and R_4 are each independently of the other hydrogen, C_1–C_{18}-alkyl or a group



wherein X, Y, R_1, R_2, m and n have the above given meaning, or R_3 and R_4 together with the nitrogen, on which they are bound, form a pyrrolidinyl-, piperidinyl- or morpholinyl residue, and wherein A(B)$_x$ may contain additional

=N—, —NH— or —NH_2 groups.

4. A method according to claim **1**, wherein said step (1) is carried out by

(1a) forming a polymer layer containing a polymer or a natural or synthetic resin material (b') and optionally a catalyst (c), then

(1b) superposing a donor layer comprising a pigment precursor (a) and a polymer or a natural or synthetic resin material (b') onto the polymer layer,

(1c) locally heating the donor layer to transfer the pigment precursor in selected target areas, and

(1d) removing the donor layer from the receiver layer.

6,040,109

METHOD FOR PREPARING AN IMAGE ELEMENT FOR MAKING AN IMPROVED PRINTING PLATE ACCORDING TO THE SILVER SALT DIFFUSION TRANSFER PROCESS

Paul Coppens, Turnhout, and Marcus Jonckheere, Oostkamp, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Provisional application No. 60/081,900, Apr. 16, 1998. This application Feb. 22, 1999, Appl. No. 252,677.

Claims priority, application European Pat. Off., Mar. 25, 1998, 98201010

Int. Cl.[7] **G03F** *7/07;* **G03C** *8/28;8/06;11/22*

U.S. Cl. 430—204 **5 Claims**

1. A method for preparing an imaging element comprising the steps of coating in the order given on a grained and anodized side of an aluminum support (i) an image receiving layer containing physical development nuclei, (ii) a photosensitive layer containing a silver halide emulsion being in water permeable relationship with said image receiving layer and (iii) optionally an antistress layer being in water permeable relationship with said image receiving layer comprising unhardened gelatin, characterized in that said aluminum support when being coated with said photosensitive layer is in contact with a guiding roller, heated at a temperature between 35 and 70° C.

6,040,110

PROCESS AND APPARATUS FOR THE REMOVAL OF RESIST

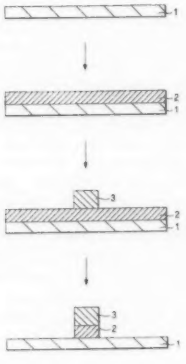
Seiichirou Shirai; Toshihiko Onozuka; Takayuki Noishiki; Satoshi Sakai; Katsuhiro Sasajima, all of Tokyo; Eiji Toyoda, and Makoto Namikawa, both of Osaka, all of Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Aug. 6, 1998, Appl. No. 129,842

Claims priority, application Japan, Aug. 12, 1997, 9-217358

Int. Cl.[7] **G03C** *11/12*

U.S. Cl. 430—258 **12 Claims**



1. A process for the removal of a resist layer formed on a semiconductor substrate, which comprises the steps of:

(1) forming a gate oxide layer on said semiconductor substrate;

(2) forming a resist layer as a resist pattern on said gate oxide layer;

(3) removing said gate oxide layer at unnecessary areas utilizing said resist layer as a mask;

(4) applying a pressure-sensitive adhesive sheet to said semiconductor substrate such that the gate oxide layer left on the semiconductor substrate and the resist layer are masked; and

(5) peeling said pressure-sensitive adhesive sheet together with said resist layer off the semiconductor substrate to separate and remove said resist layer from said semiconductor substrate,

wherein said steps (2) and (3) are consecutive steps.

6,040,111

AROMATIC HYDROXYCARBOXYLIC ACID RESINS AND THEIR USE

Akio Karasawa; Akihiro Yamaguchi, both of Kanagawa-ken; Keizaburo Yamaguchi, Chiba-ken, and Yuko Ishihara, Kanagawa-ken, all of Japan, assignors to Mitsui Chemicals, Inc., Japan

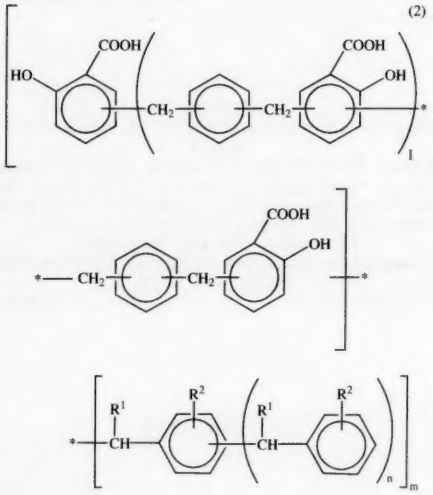
Division of application No. 08/511,809, Aug. 7, 1995, Pat. No. 5,798,422. This application Dec. 18, 1997, Appl. No. 993,657.

Claims priority, application Japan, Aug. 25, 1994, 6-200836; Aug. 25, 1994, 6-200837; Aug. 25, 1994, 6-200838; Oct. 13, 1994, 6-247883

Int. Cl.[7] **C08G** *61/02;* **C08F** *6/00*

U.S. Cl. 430—270.1 **4 Claims**

1. A photoresist composition comprising a hydroxycarboxylic acid resin represented by the following formula (2), and which is an aralkylated salicylic resin having a number-average molecular weight of 450–20,000 and a carboxylic acid equivalent of 245–440 g/eq:



wherein R^1 represents a hydrogen atom or a C_{1-4} alkyl, R^2 represents a hydrogen atom, a C_{1-10} alkyl, a C_{1-10} alkoxyl, nitro or hydroxyl group, l stands for an integer of 0–100, m stands for an integer of 1–20 and n stands for an integer of 0–3.

6,040,112

PHOTORESIST COMPOSITION

Yuko Yako, Takatsuki; Kenji Takahashi, Osaka; Hiroshi Takagaki, Higashiosaka, and Nobuhito Fukui, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 22, 1998, Appl. No. 83,436

Claims priority, application Japan, May 26, 1997, 9-135254

Int. Cl.[7] **G03F** *7/004*

U.S. Cl. 430—270.1 **2 Claims**

1. A positive photoresist composition comprising

(A) a resin which is converted to alkali-soluble from alkali-insoluble or alkali slightly soluble by the action of an acid and contains a resin obtained by partially protecting a phenolic hydroxyl group in a polyvinylphenol resin with a 1-ethoxyethyl group,

(B) a diazomethanedisulfonyl compound as an acid generator and

(C) a tertiary amine compound (having an ether bond) represented by the following formula (I):

$$R^1R^2N—X—OR^3 \quad (I)$$

Wherein x represents a divalent aliphatic group, R^1, R^2 and R^3 represent each independently a monovalent aliphatic group, aromatic group or aromatic aliphatic group, provided that R^1 and R^2 form a ring together with a nitrogen atom to which they bond, R^1 and a carbon atom in X form a ring together with a nitrogen atom to which they bond, or R^1 and R^3 form a ring together with —N—X—O—.

6,040,113

HEAT-SENSITIVE IMAGING ELEMENT FOR MAKING POSITIVE WORKING PRINTING PLATES

Marc Van Damme, Heverlee, and Joan Vermeersch, Deinze, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Provisional application No. 60/040,408, Mar. 11, 1997. This application Feb. 18, 1998, Appl. No. 25,341.

Int. Cl.[7] **G03F** *7/00*

U.S. Cl. 430—271.1 **14 Claims**

1. A heat sensitive imaging element for making a lithographic printing plate comprising on a lithographic base having a hydrophilic surface;

a hydrophobic layer un-sensitive to visible and UV light comprising a hydrophobic polymer soluble in an aqueous alkaline solution and

a top layer having a decreased or increased capacity for being penetrated and/or solubilized by an aqueous alkaline solution comprising a compound sensitive to IR-radiation.

6,040,114

PATTERN FORMING METHOD

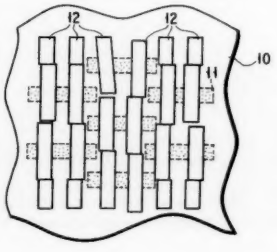
Soichi Inoue, Yokohama; Iwao Higashikawa, Tokyo; Yoji Ogawa, Yokohama; Shigehiro Hara, Kawasaki, and Kazuko Yamamoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 23, 1997, Appl. No. 838,944

Claims priority, application Japan, Apr. 26, 1996, 8-107439

Int. Cl.[7] **B03C** *5/00*

U.S. Cl. 430—296 **10 Claims**



1. A method for forming a gate pattern for a semiconductor device, comprising:

forming an active area pattern of the semiconductor device, said active area pattern including active portions surrounded by isolation region portions;

forming a photosensitive film on a conductive layer for the gate pattern above the active area pattern and the isolation region;

exposing the photosensitive film by sequentially radiating with respective single shots of a radiation beam a plurality of butting unit regions defining butting portions between said butting unit regions;

controlling said radiating of said butting unit regions so that said butting portions of said butting unit regions are formed only above the isolation region portions of the semiconductor device and not above the active portions of the active area pattern;

developing the exposed photosensitive film; and

etching the conductive layer to form the gate pattern such that the gate pattern extends over the active area pattern and the isolation region.

6,040,115

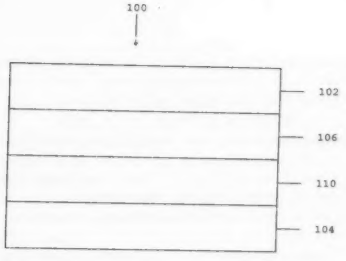
PROCESSLESS PLANOGRAPHIC PRINTING PLATE

David B. Bailey; Mitchell S. Burberry, both of Webster, and Mark A. Harris, Rocester, all of N.Y., assignors to Kodak Polychrome Graphics LLC, Norwalk, Conn.

Continuation-in-part of application No. 08/749,050, Nov. 14, 1996, abandoned. This application Dec. 9, 1998, Appl. No. 208,520.

Int. Cl.[7] **G03F** *7/26;* **B41N** *1/00*

U.S. Cl. 430—303 **31 Claims**



1. A process for producing a lithographic printing plate, the process comprising:

thermally imaging an imageable element, the element comprising:

(a) an ink receptive substrate; and

(b) an ink repellent, thermally sensitive surface layer overlying the substrate, the layer comprising an ink repellent, thermally sensitive co-polymer;

in which:

the thermally sensitive co-polymer comprises one or more silicone segments and one or more hard segments;

the silicone segments comprise 50 to 98 weight percent of the thermally sensitive co-polymer; the hard segments provide physical integrity and thermal sensitivity to the thermally sensitive co-polymer; and

either (1) no layer overlies the ink repellent, thermally sensitive surface layer or (2) a slipping layer removable by a printing operation overlies the ink repellent, thermally sensitive surface layer.

6,040,116

PHOTOSENSITIVE RECORDING ELEMENT HAVING A RECORDING LAYER AND A TOP LAYER POSSESSING DIFFERENT SOLUBILITY PROPERTIES, AND ITS DEVELOPMENT IN ONE OPERATION

Thomas Telser, Weinheim; Wolfgang Huemmer, Limburgerhof, and Karl-Rudolf Kurtz, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of application No. 08/692,640, Aug. 5, 1996, abandoned, which is a continuation of application No. 07/752,488, filed as application No. PCT/EP90/00407, Mar. 14, 1990. This application Jul. 14, 1997, Appl. No. 892,350.

Claims priority, application Germany, Mar. 17, 1989, 39 08 763; WIPO, Mar. 14, 1990, PCT/EP90/00407

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03F** *7/32*

U.S. Cl. 430—306 **8 Claims**

1. A process for the production of a flexographic relief printing plate having a photopolymerized relief layer from a photosensitive recording element comprising (A) a dimensionally stable substrate, (B) a photopolymerizable relief-forming recording layer, which comprises a single layer or two or more individual layers, and (C) an optically transparent top layer,

wherein the optically transparent top layer (C) firmly adheres to the surface of the recording layer (B),

said process comprising:

(1) imagewise exposure of the photopolymerizable relief-forming recording layer (B) to actinic light, with the result that there is a difference between the solubilities of the exposed and unexposed parts of the recording layer (B),

(2) washout (development) of the optically transparent top layer (C) and of the unexposed and therefore nonphotopolymerized parts of the imagewise exposed relief-forming recording layer (B) with a developer with formation of the photopolymerized relief layer,

wherein

development (process step 2) is carried out in one operation using a water-in-oil emulsion as the sole developer,

the water-in-oil emulsion consists of an aqueous phase and an organic phase,

the organic phase consists of a solvent selected from the group consisting of n-hexane, n-heptane, octane, cyclohexane, hexylcyclohexane, petroleum ether, naphtha, mineral spirits, mineral spirits from which aromatic constituents have been removed, synthetic isoparaffins, n-paraffins, hydrogenated mineral oils, petroleum fractions, hydrogenated oil fractions, xylene, ethylbenzene, diethyl-substituted benzenes, n-butylbenzene, n-pentylbenzene, n-hexylbenzene, isopropylbenzene, ketones, halogenated aliphatic hydrocarbons, a mixture of two or more of these solvents, and a mixture of one or more of these solvents with alcohol and/or minor amounts of surfactant, and

the optically transparent top layer (C) is soluble in aqueous solvents but insoluble in the organic phase suitable and effective for developing the layer (B), and the unexposed parts of the recording layer (B) are insoluble in aqueous solvents.

6,040,117

NEGATIVE PHOTORESIST STRIPPING LIQUID COMPOSITION

Toshiyuki Ota; Kimiyasu Sano, both of Tsukuba; Hideaki Tashiro, Yokkaichi, and Hozumi Sato, Tsukuba, all of Japan, assignors to JSR Corporation, Tokyo, Japan

Filed Feb. 24, 1998, Appl. No. 28,290

Claims priority, application Japan, Feb. 24, 1997, 9-055549

Int. Cl.[7] **G03F** *7/42*

U.S. Cl. 430—311 **16 Claims**

1. A negative photoresist stripping liquid composition consisting essentially of from 30% by weight to 75% by weight of dimethyl sulfoxide, from 20% by weight to 65% by weight of 1,3-dimethyl-

2-imidazolidinone, from 0.1% by weight to 5% by weight of a tetraalkylammonium hydroxide and from 0.5% by weight to 15% by weight of water.

6,040,118

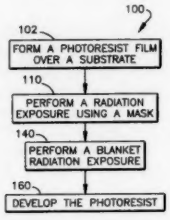
CRITICAL DIMENSION EQUALIZATION ACROSS THE FIELD BY SECOND BLANKET EXPOSURE AT LOW DOSE OVER BLEACHABLE RESIST

Luigi Capodieci, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1998, Appl. No. 183,356

Int. Cl.[7] **G03F** *7/20*

U.S. Cl. 430—328 **19 Claims**



1. A method of providing critical dimension uniformity in a radiation sensitive film, comprising the steps of:

forming a radiation sensitive film over a substrate, wherein the radiation sensitive film exhibits substantial bleaching upon an exposure thereof;

exposing the radiation sensitive film to radiation using a mask having a pattern thereon, wherein a first feature and a second feature on the mask are intended to provide the same critical dimension on the radiation sensitive film, wherein the exposing forms an exposure pattern on the radiation sensitive film corresponding to the mask pattern, and wherein a transferred first feature critical dimension on the radiation sensitive film corresponding to the first mask feature is larger than the second transferred feature critical dimension on the radiation sensitive film corresponding to the second mask feature due to radiation non-uniformities or imaging non-uniformities; and

exposing the radiation sensitive film to a blanket radiation exposure, wherein the blanket radiation exposure has a dose which is substantially less than the exposure using the mask, and wherein the blanket exposure provides effectively a greater dose to the first transferred feature than a radiation dose to the second transferred feature due to variations in a bleaching of the radiation sensitive film at the first and second transferred features, thus decreasing the critical dimension of the first transferred feature more than the critical dimension size of the second transferred feature, thereby reducing a difference in the critical dimension of the first and second transferred features which results in improved critical dimension uniformity.

6,040,119

ELIMINATION OF PROXIMITY EFFECT IN PHOTORESIST

Tsai-Sheng Gau, and Chang-Ming Dai, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Filed Mar. 27, 1998, Appl. No. 49,213

Int. Cl.[7] **G03F** *7/26*

U.S. Cl. 430—330 **5 Claims**

1. A process for photolithography, comprising:

providing an optical mask;

coating a substrate with a layer of photoresist, said photoresist having been supplied by a manufacturer together with recommended ranges for processing;

drying the layer of photoresist;

using actinic radiation having a partial coherence value between 0.6 and 0.9, and projecting an image of the mask on the layer of photoresist by means of an imaging system having a numerical aperture between 0.5 and 0.7, for a first time period;

and then baking the substrate and photoresist, at a temperature that is between 20 and 25° C. lower than the ranges recommended by the manufacturer, for a second time period; and

then developing said layer of photoresist whereby an image that is free of proximity effects, and having a critical dimension, is produced.

6,040,120

THERMAL PROCESSING APPARATUS

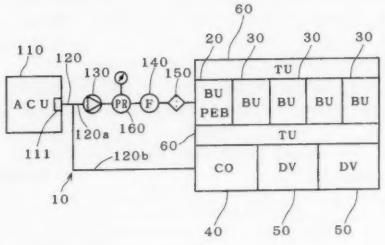
Masanao Matsushita, and Hideyuki Taniguchi, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 28, 1998, Appl. No. 14,485

Claims priority, application Japan, Jan. 31, 1997, P09-018259

Int. Cl.[7] **H01L** *21/027;21/30*

U.S. Cl. 430—347 **16 Claims**



1. A thermal processing apparatus for thermally processing a substrate that has been coated with a chemical amplified resist and subjected to exposure processing, comprising:

a chamber for housing a substrate;

heating means for heating said substrate disposed in said chamber;

air conditioning means for obtaining conditioned air whose temperature and humidity are conditioned;

an air supplying path for supplying said conditioned air to said chamber; and

pressure means disposed in said air supplying path, for supplying said conditioned air to said chamber by the application of pressure.

6,040,121

TWO-STAGE PROCESSING OF LOW SILVER BLACK-AND-WHITE PHOTOGRAPHIC ELEMENTS

Alan S. Fitterman, Rochester, and Robert E. Dickerson, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1999, Appl. No. 313,952

Int. Cl.[7] **G03C** *5/38*

U.S. Cl. 430—419 **16 Claims**

1. A method for providing a black-and-white image comprising:

A) in a processing container, developing an imagewise exposed black-and-white photographic silver halide element using a black-and-white developing composition that has a pH of from about 9 to about 12 and is free of ammonium ions, and comprises:

from about 100 to about 300 mmol/l of a black-and-white developing agent, and

from about 200 to about 500 mmol/l of sulfite ions, and

B) within up to 30 seconds of the beginning of step A, introducing into said processing container, a fixing composition that is free of ammonium ions and has a pH of from about 4 to about 6, and comprises from about 500 to about 1500 mmol/l of a photographic fixing agent other than a sulfite, and continuing processing for up to an additional 60 seconds,

wherein prior to step A, said black and white photographic silver halide element comprises a support having disposed on each side thereof, a silver halide emulsion unit that comprises silver halide grains and a gelatino-vehicle, said silver halide grains comprising at least 95 mol % bromide based on total silver, at least 50% of the silver halide grain projected area being provided by tabular grains having an average aspect ratio greater than 8, a thickness no greater than 0.10 μm, and an average grain diameter of from about 1.5 to about 3 μm,

the coverage of silver in each silver halide emulsion unit being no more than 11 mg/dm^2, and the coverage of the gelatino-vehicle in each silver halide emulsion unit being no more than 11 mg/dm^2.

6,040,122

BLEACHING BATH

Thomas Fogel, Strassenhaus; Jürgen Göhmann, Monheim, and Norman Klaunzer, Leverkusen, all of Germany, assignors to Agfa Gevaert NV, Belgium

Filed May 25, 1999, Appl. No. 318,514

Claims priority, application Germany, Jun. 5, 1998, 198 25 180

Int. Cl.^{7} G03C *7/42*

U.S. Cl. 430—461 **12 Claims**

1. Bleaching bath for processing photographic silver halide materials which comprises hydrogen peroxide as the active substance, wherein the bath contains at least one organic compound having a sulfinic acid function and a further functional group with free electron pairs.

6,040,123

FINAL RINSING SOLUTION FOR COLOR PHOTOGRAPHIC PRODUCT

Cecile A. Maudhuit, Chalon sur Saone, and Jacques Bulou, Saint-Remy, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1999, Appl. No. 322,621

Int. Cl.^{7} G03C *7/30*

U.S. Cl. 430—463 **13 Claims**

1. An aqueous rinsing solution for silver halide photographic products comprising an anionic surfactant and a non-ionic surfactant wherein said solution has a static surface tension less than or equal to 32 mN/m and a dynamic surface tension of less than 50 mN/m.

6,040,124

IMAGING ELEMENT WITH BIAXIALLY ORIENTED SHEET WITH FLUOROPOLYMER

Peter T. Aylward, Hilton; Robert P. Bourdelais, Pittsford; Thaddeus S. Gula, Rochester, and Pang-Chia Lu, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1998, Appl. No. 196,910

Int. Cl.^{7} G03C *1/79*

U.S. Cl. 430—496 **23 Claims**

1. An imaging element comprising a substrate having adhered to each side a biaxially oriented sheet of polyolefin polymer of at least one layer, wherein at least one of the biaxially oriented sheets has incorporated therein an amount of a fluoropolymer processing aid, and wherein said fluoropolymer is in the amount of about 0.01% to 3% by weight of said at least one sheet.

6,040,125

HIGH-SPEED COLOR PHOTOGRAPHIC RECORDING MATERIAL HAVING INCREASED SENSITIVITY IN THE BLUE SPECTRAL REGION

Jörg Siegel, Köln; Hans-Ulrich Borst, Elsdorf; Peter Bell, Köln; Ralf Büscher, Lohmar; Heinz Reif, Köln, and Jürgen Jung, Leverkusen, all of Germany, assignors to Agfa-Gevaert NV, Germany

Filed Mar. 13, 1998, Appl. No. 42,401

Claims priority, application Germany, Mar. 18, 1997, 197 11 142

Int. Cl.^{7} G03C *1/46*

U.S. Cl. 430—506 **4 Claims**

1. A high-speed color photographic recording material which comprises at least one red-sensitive silver halide emulsion layer unit with which a cyan coupler is associated, at least one green-sensitive silver halide emulsion layer unit with which a magenta coupler is associated, at least one blue-sensitive silver halide emulsion layer unit with which a yellow coupler is associated and optionally further light-insensitive layers, and said blue-sensitive silver halide emulsion layer unit comprises at least two blue-sensitive partial layers which are sensitized with sensitizing dyes in such a way that a sensitivity curve ensues which is characterized by the following parameters:

$$460\ \text{nm} \leqq \lambda(S_{max}) \leqq 480\ \text{nm}$$

$$b_{80} \geqq 24\ \text{nm}$$

$$b_{50} \geqq 91\ \text{nm}$$

$$b_{20} \geqq 106\ \text{nm},$$

wherein

$\lambda(S_{max})$	denotes the wavelength of the sentivity curve maximum (100% sensitivity);
b_{80}	denotes the width of the senitivity curse at 80% of the maximum sensitivity;
b_{50}	denotes the width of the sensitivity curve at 50% of the maximum sensitivity;
b_{20}	denotes the width of the sensitivity curve at 50% of the maximum sensitivity and the content of UV absorber compounds having an absorption maximum between 360 and 390 nm in layers disposed above the blue-sensitive silver halide emulsion layer unit amounts to not more than 100 mg/m^2 in total.

6,040,126

PHOTOGRAPHIC YELLOW DYE-FORMING COUPLERS

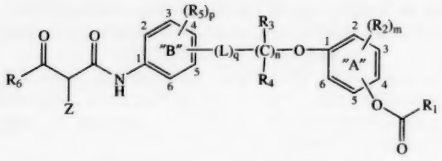
Ping-Wah Tang, Yorktown; Barbara B. Lussier, and Stanley W. Cowan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1998, Appl. No. 218,512

Int. Cl.^{7} G03C *1/08;7/26;7/32*

U.S. Cl. 430—557 **11 Claims**

1. A photographic element comprising a light sensitive silver halide emulsion layer having associated therewith an open chain a-carbonyl acetanilide yellow dye-forming coupler compound having the formula:



wherein

R_1 is selected from the group consisting of alkyl, aryl, heterocyclic, and amino groups, provided that R_1 may form a ring bonded to another carbon atom which is a member of Ring "A";

each R_2 is independently a substituent having a Hammett's sigma value of 0 or less, and m is from 0 to 4;

each R_3 and R_4 for each of the n carbon atoms is independently selected from the group consisting of hydrogen, alkoxy, aryl, heterocyclic, aryloxy, and alkyl groups, and n is 0 to 16;

each R_5 is independently selected from the group consisting of amino, alkyl groups, and groups linked to the "B" ring by oxygen or sulfur, and p is 1 to 3, provided that two R_5 groups may join to form a ring;

R_6 is a multicarbocyclic or multiheterocyclic group having a common vertex through which it is attached to the indicated carbonyl group;

each L is independently a divalent linking group and q is 0 to 3;

Ring "A" is bonded indirectly to the 3-, 4-, or 5-position of Ring "B", and

Z is hydrogen or a group capable of coupling-off when the coupler reacts with an oxidized color developer.

6,040,127

METHOD FOR PRODUCING SILVER HALIDE EMULSION AND PHOTOGRAPHIC MATERIAL CONTAINING THE SAME

Masayuki Kuramitsu; Mitsuo Saitou; Yutaka Maeno, and Takefumi Hara, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1996, Appl. No. 777,624

Claims priority, application Japan, Jan. 10, 1996, 8-002080; Jan. 12, 1996, 8-003567

Int. Cl.[7] G03C *1/015;1/035;1/047*

U.S. Cl. 430—567 **18 Claims**

1. A method for producing a silver halide emulsion in which grains having an aspect ratio of from 1.5 to 100 occupy from 75 to 100% of the total projected area of all grains comprising at least nucleation, ripening and grain growth processes in a dispersion medium solution containing water and a dispersion medium, wherein the dispersion medium solution contains low molecular weight gelatin having a molecular weight of from 1,000 to 70,000 at least during a nucleation process and chemically modified gelatin having a chemical modification rate of an amino group of from 15% to 100% at least during a grain growth process, wherein silver halide grains have 10 or more dislocation lines per one grain in proportion of 50% or more of the number of all the grains in said emulsion.

6,040,128

PROCESSES OF PREPARING RADIATION-SENSITIVE SILVER HALIDE EMULSIONS

John W. Boettcher, Webster; Seshadri Jagannathan; Michael W. Orem, both of Rochester, and Philip J. Zola, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 24, 1998, Appl. No. 160,032

Int. Cl.[7] G03C *1/015;1/035;1/043*

U.S. Cl. 430—569 **11 Claims**

1. A process of preparing a radiation-sensitive silver halide emulsion comprising

reacting silver and halide ions in an aqueous dispersing medium to form radiation-sensitive silver halide grains in the presence of a polyalkylene oxide block copolymer surfactant,

WHEREIN dispersion of the polyalkylene oxide block copolymer surfactant in the aqueous dispersing medium is increased by the inclusion of an auxiliary surfactant that, in the form of an aqueous solution containing 10 percent by weight of the auxiliary surfactant based on total weight of the aqueous solution, is miscible in all proportions with at least one of water and the polyalkylene oxide block copolymer surfactant.

6,040,129

PHOTOGRAPHIC EMULSION HAVING AN IMPROVED SPEED, PHOTOGRAPHIC ELEMENT CONTAINING SAID EMULSION, AND METHOD

Stephen A. Godleski, Fairport; David A. Dickinson, Brockport, and Antony J. Williams, West Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1999, Appl. No. 288,900

Int. Cl.[7] G03L *1/08*

U.S. Cl. 430—604 **13 Claims**

1. A photographic emulsion comprising dispersed in a binder sensitized silver halide grains wherein the emulsion is sensitized from an organometallic compound of formula:

$$(R)_n(X)_mM \qquad (I)$$

wherein M is a metal selected from the group consisting of lead, tin, boron, bismuth and thallium, each R is independently an alkyl group, a cycloalkyl group, an aryl group, a heterocyclic group, an alkenyl group or a alkynyl group, each X is independently halogen, hydroxy, or alkoxy, n is 1 to 4 and m is 0 to 3, with the proviso that when M is lead or tin, n is 1 to 4 and m+n is 4, when M is boron or bismuth, n is 1 to 3 and m+n is 3 and when M is thallium, either n is 1 and m is 0, or n is 1 to 3 and n+m is 3.

6,040,130

PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC FILMS CONTAINING LOW LEVELS OF UNSATURATED FATTY ACID TO PREVENT FOG

Alfred J. Alton, Hilton; James P. Beese, Spencerport; Juris L. Ekmanis, Victor; Bruce J. Henne, Rochester, and William F. Smith, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1997, Appl. No. 798,202

Int. Cl.[7] G03C *1/498*

U.S. Cl. 430—617 **15 Claims**

1. A method of preparing a photothermographic composition comprising:

A. preparing a dispersion of:

a. an oxidation-reduction image-forming combination comprising:

i. a silver salt of a fatty acid oxidizing agent and

ii. an organic reducing agent with:

b. a synthetic polymer-peptized photosensitive silver halide, and

c. a toner in

d. a non-gelatin polymeric binder and

B. the improvement wherein said composition contains less than about 800 micrograms of polyunsaturated and 3800 micrograms of monounsaturated fatty acid silver salts per gram of oxidizing agent.

6,040,131

COLOR PHOTOTHERMOGRAPHY

Lyn M. Eshelman, Penfield, and Timothy W. Stoebe, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of application No. 09/045,382, Mar. 20, 1998, Pat. No. 5,963,307. This application Apr. 13, 1999, Appl. No. 290,291.

Int. Cl.[7] G03C *1/498*

U.S. Cl. 430—619 **4 Claims**

1. A photothermographic film comprised of

a support and, coated on the support,

a photographically responsive, thermally developable panchromatically sensitized emulsion layer unit containing

radiation-sensitive silver halide grains, at least 50 percent of the projected area of the grains being accounted for by tabular grains,

a plurality of spectral sensitizing dyes adsorbed to the surface of the radiation-sensitive silver halide grains chosen to provide light sensitivity in the blue, green and red portions of the spectrum,

a light-insensitive, reducible source of silver,

a development component capable of providing a dye image, and

a hydrophilic colloid vehicle.

6,040,132

METHODS FOR THE LYOPHILIZATION OF LIVING BIOLOGICAL MATERIALS

Philippa M. Wiggins, Mairangi Bay, New Zealand, assignor to Biostore New Zealand, Ltd., Parnell, New Zealand

Continuation-in-part of application No. 09/060,770, Apr. 15, 1998, which is a continuation-in-part of application No. 08/989,470, Dec. 12, 1997, Pat. No. 5,962,213, which is a continuation-in-part of application No. 08/842,553, Apr. 15, 1997, which is a continuation-in-part of application No. 08/722,306, Sep. 30, 1996, Pat. No. 5,827,640, which is a continuation-in-part of application No. 08/662,244, Jun. 14, 1996, Pat. No. 5,879,875. This application May 26, 1998, Appl. No. 85,334.

Int. Cl.[7] A01N *1/02*

U.S. Cl. 435—2 **15 Claims**

1. A method for the preservation of a biological material selected from the group consisting of platelets, platelet membranes and red blood cells, comprising:

(a) contacting the biological material with a preservative solution, wherein the preservative solution consists essentially of betaine, sodium citrate and sodium chloride, the preservative solution being substantially isotonic with the biological material and substantially free of iodide, dihydrogen phosphate, bicarbonate, nitrate and bisulfate;

(b) cooling the biological material to a temperature of less than about −140° C.; and

(c) drying the biological material to provide a freeze-dried material.

6,040,133

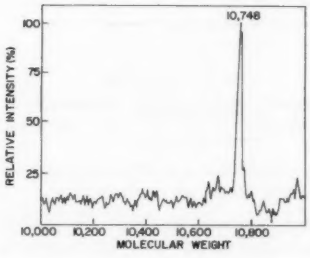
D-ENZYME COMPOSITIONS AND METHODS OF THEIR USE

Stephen Brian Henry Kent; Saskia Charlotte Florence Milton, and Raymond Cecil deLisle Milton, all of La Jolla, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of application No. 08/343,585, Dec. 2, 1994, which is a continuation-in-part of application No. 07/894,817, Jun. 8, 1992, abandoned. This application May 22, 1996, Appl. No. 651,144.

Int. Cl.[7] C12Q *1/00;1/37;1/34;1/44*

U.S. Cl. 435—4 **2 Claims**



1. A method for screening a library for identifying an active enantiomer of a chiral drug candidate having activity with respect to an L-enzyme, the activity being selected from a group consisting of enzyme inhibition and enzyme binding, the chiral drug candidate having a first and a second enantiomer, the first enantiomer being active and the second enantiomer being inactive with respect to the L-enzyme, the library including the second enatiomer but excluding the first enatiomer, the method comprising the following steps:

Step A: providing a D-enzyme, the D-enzyme being an enantiomer of the L-enzyme, the second enantiomer of the chiral drug candidate being active with respect to the D-enzymne; then

Step B: contacting the library under reaction conditions with the D-enzyme of said Step A for identifying the second enatiomer by its activity with the D-enzyme; then

Step C: providing the first enatiomer using information obtained from the identification of the second enatiomer in said Step B; and then

Step D: contacting the L-enzyme under reaction conditions with the first enantiomer, provided in said Step C, for verifying the activity of the first enantiomer of the chiral drug candidate with rspect to the L-enzyme.

6,040,134

METHOD OF DIAGNOSING PRECLINICAL DIABETES

Ole Dragsbaek Madsen, Soborg; Birgitte Koch Michelsen, Lyngy; Jacob Steen Petersen, Copenhagen, all of Denmark; Bart O. Roep, Leiden, Netherlands, and Borge Teisner, Odense, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of application No. PCT/DK96/00050, Jan. 31, 1996. This application Jul. 15, 1997, Appl. No. 892,783.

Claims priority, application Denmark, Jan. 31, 1995, 0109/95

Int. Cl.[7] G01N *33/50;33/53;33/564;33/567*

U.S. Cl. 435—4 **8 Claims**

1. A method of diagnosing preclinical insulin-dependent diabetes mellitus (IDDM), comprising contacting fetal antigen 1 (FA1) with T cells of a subject to be diagnosed for preclinical IDDM and detecting any T cell response to the FA1, such a response being indicative of preclinical IDDM in the subject.

6,040,135

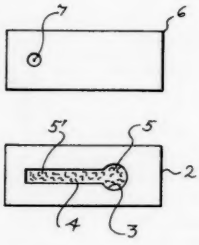
METHOD FOR CORRECTING FOR BLOOD VOLUME IN A SERUM ANALYTE DETERMINATION

Steven P. Tyrrell, Highland Park, Ill., assignor to Biosafe Laboratories, Inc., Chicago, Ill.

Provisional application No. 60/077,030, Mar. 6, 1998. This application Mar. 5, 1999, Appl. No. 264,169.

Int. Cl.[7] C12Q *1/00;1/60;1/37*

U.S. Cl. 435—4 8 Claims



1. A method for determining the concentration of a serum analyte from a solution formed from a dried blood sample in which the analyte and hematocrit determinations are made wherein the improvement comprises the steps of:

(a) measuring the hemoglobin level in the solution; and

(b) calculating the hematocrit from the hemoglobin level;

(c) calculating the concentration of the serum analyte from the analyte level and the hemocrit determined from the hemoglobin level.

6,040,136

ENRICHMENT METHOD FOR VARIANT PROTEINS WITH ALTERED BINDING PROPERTIES

Lisa J. Garrard, Burlingame; Dennis J. Henner, Pacifica; Steven Bass, Redwood City, all of Calif.; Ronald Greene, Durham, N.C.; Henry B. Lowman, Hercules, Calif.; James A. Wells, Burlingame, Calif., and David J. Matthews, San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of application No. 08/463,587, Jun. 5, 1995, Pat. No. 5,821,047, which is a division of application No. 08/050,058, filed as application No. PCT/US91/09133, Dec. 3, 1991, Pat. No. 5,750,373, which is a continuation-in-part of application No. 07/743,614, Aug. 9, 1991, abandoned, which is a continuation-in-part of application No. 07/715,300, Jun. 14, 1991, abandoned, which is a continuation-in-part of application No. 07/683,400, Apr. 10, 1991, abandoned, which is a continuation-in-part of application No. 07/621,667, Dec. 3, 1990, abandoned. This application Sep. 3, 1997, Appl. No. 923,854.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/70;* C12P *21/06;* C07K *14/00;* C07H *17/00*

U.S. Cl. 435—5 45 Claims

1. A phagemid expression vector, comprising a transcription regulatory element operably linked to a gene fusion encoding a fusion protein, wherein the gene fusion comprises a first gene encoding a polypeptide and a second gene encoding at least a portion of a phage coat protein, the vector not containing a further gene encoding a mature phage coat protein.

6,040,137

ANTIGEN/ANTIBODY SPECIFICATION EXCHANGER

Matti Sällberg, Stockholm, Sweden, assignor to Tripep AB, Sweden

Continuation of application No. 08/737,085, filed as application No. PCT/SE95/00468, Apr. 27, 1995. This application Feb. 8, 1999, Appl. No. 246,258.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/70*

U.S. Cl. 435—5 18 Claims

1. An antigen/antibody specificity exchanger, comprising a first specific binding sequence that specifically binds to an antigen, including a hapten, covalently linked to a second sequence comprising an epitope of a pathogen.

6,040,138

EXPRESSION MONITORING BY HYBRIDIZATION TO HIGH DENSITY OLIGONUCLEOTIDE ARRAYS

David J. Lockhart, Santa Clara, Calif.; Eugene L. Brown, Newton Highlands, Mass.; Gordon G. Wong, Brookland, N.Y.; Mark S. Chee, Palo Alto, and Thomas R. Gingeras, Encinitas, both of Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Filed Sep. 15, 1995, Appl. No. 529,115

Int. Cl.[7] C12Q *1/68;* C07H *21/04;21/02*

U.S. Cl. 435—6 45 Claims

1. A method of analyzing the expression of one or more genes, said method comprising:

(a) providing a pool of target nucleic acids comprising RNA transcripts of one or more of said genes, or nucleic acids derived therefrom using said RNA transcripts as templates;

(b) hybridizing said pool of tarzet nucleic acids to an array of oligonucleotide probes immobilized on a surface, said array comprising more than 100 different oligonucleotides, at least some of which comprise control probes, wherein each different oligonucleotide is localized in a predetermined region of said surface, the density of said different oligonucleotides is greater than about 60 different oligonucleotides per 1 cm^2, and at least some of said oligonucleotide probes are complementary to said RNA transcripts or said nucleic acids derived therefrom using said RNA transcripts; and

(c) quantifying the hybridization of said nucleic acids to said array, wherein said quantification is proportional to the expression level of said genes.

6,040,139

LASER CELL PURIFICATION SYSTEM

G. Steven Bova, 331 Tuscany Rd., Baltimore, Md. 21210

Filed Sep. 19, 1995, Appl. No. 530,791

Int. Cl.[7] C12Q *1/68;* C12M *1/00*

U.S. Cl. 435—6 15 Claims

1. An apparatus for purifying a heterogenous cell population in a tissue section, said apparatus comprising:

(a) a microscope with an objective for viewing a tissue section having a heterogenous population of cells fixed on a tissue support;

(b) a stage for supporting said tissue support;

(c) a drive means for providing relative movement between said tissue support and said objective and for generating an address signal within an x-y coordinate plane for each incremental location;

(d) a video camera mounted on said microscope for generating a video image of said tissue section at each selected incremental location;

(e) selection means for analyzing each image of said tissue section and for identifying target cells in said heterogenous tissue section; and

(f) a radiant energy beam generating means for automatically and selectively ablating only those said target cells identified by said selection means.

6,040,140

METHODS FOR SCREENING AND TREATING LEUKEMIAS RESULTING FROM ALL-1 REGION CHROMOSOME ABNORMALITIES

Carlo Croce, Philadelphia, and Eli Canaani, Glenside, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of application No. 08/062,443, May 14, 1993, abandoned, which is a continuation-in-part of application No. 07/971,094, Oct. 30, 1992, abandoned, which is a continuation-in-part of application No. 07/888,839, May 27, 1992, abandoned, which is a continuation-in-part of application No. 07/805,093, Dec. 11, 1991, abandoned. This application Mar. 7, 1996, Appl. No. 545,860.

Int. Cl.[7] **C12Q** *1/68;* **C12P** *19/34;* **C07H** *21/04;21/02*

U.S. Cl. 435—6 **12 Claims**

3. A method of diagnosing acute lymphoblastic or nonlymphoblastic leukemia comprising:

providing a tissue sample containing hematopoietic cells from a person suspected of having acute lymphoblastic or nonlymphoblastic leukemia; and detecting chromosome abnormalities within a gene in genetic material from the cells, said gene selected from the group consisting of: the AF-4 gene of chromosome 4 (SEQ ID NOS. 25 and 27) and the AF-9 gene of chromosome 9 (SEQ ID NO. 29).

6,040,141

BACTERIA FOR PREPARING STABLE FUSION PROTEINS AND METHODS FOR DETECTING THE SAME

Thomas Klauser, Fellbach; Joachim Kramer, Rottenburg; Thomas F. Meyer, and Johannes Pohlner, both of Tübingen, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Berlin, Germany

PCT No. PCT/EP94/04286, § 371 Date Sep. 23, 1996, § 102(e) Date Sep. 23, 1996, PCT Pub. No. WO95/17509, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 22, 1994, Appl. No. 666,354

Claims priority, application Germany, Dec. 23, 1993, 43 44 350

Int. Cl.[7] **C12Q** *1/68;* **C12P** *21/00;* **C12N** *1/21;5/11*

U.S. Cl. 435—6 **24 Claims**

1. A bacterium possessing the markers fpt, ompT^{-} and dsbA^{-}.

6,040,142

METHOD AND PROBES FOR DETECTING MARKERS LINKED TO THE INFANTILE SPINAL MUSCULAR ATROPHY LOCUS

Judith Melki, and Arnold Munnich, both of Paris, France, assignors to Institut National de la Santa et de la Recherche Medicale, Paris, France

PCT No. PCT/FR95/00722, § 371 Date Jan. 29, 1997, § 102(e) Date Jan. 29, 1997, PCT Pub. No. WO95/33852, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 2, 1995, Appl. No. 750,064

Claims priority, application France, Jun. 3, 1994, 94 06856

Int. Cl.[7] **C07H** *21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **16 Claims**

1. An isolated nucleic acid fragment, wherein said nucleic acid fragment consists of a sequence selected from:

a) SEQ ID NOS: 1, 2, 3, 4 and 5,

b) a fragment of at least 12 contiguous nucleotides of SEQ ID NOS: 1, 2, 3 and 5, and;

c) a sequence fully complementary to the sequences a) or b).

14. A method of detection of an alteration in the human chromosome 5q13 region in a sample, comprising contacting the sample with a nucleic acid of claim **1**, determining the pattern of hybridization between said sample and said nucleic acid, said pattern being correlated to the presence or absence of an alteration in said chromosome.

6,040,143

DNA ENCODING VON WILLEBRAND FACTOR AND METHODS OF USE

Patrick J. Venta, Pinckney; George J. Brewer; Vilma Yuzbasiyan-Gurkan, both of Ann Arbor, and William D. Schall, Williamston, all of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Provisional application No. 60/020,998, Jul. 19, 1996. This application Jul. 18, 1997, Appl. No. 896,449.

Int. Cl.[7] **C07H** *21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **31 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence encoding the polypeptide of SEQ ID NO. 2.

6,040,144

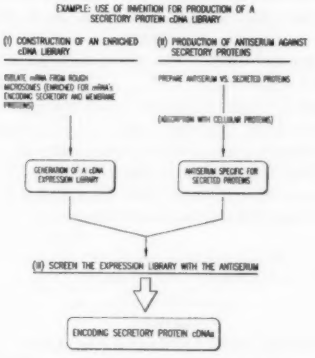
PROCEDURE FOR PREPARING GENE EXPRESSION LIBRARIES ENRICHED FOR SECRETORY PROTEIN GENES

Frank Carter Bancroft, Huntington, and Makiko Fliss, New York, both of N.Y., assignors to Mount Sinai School of Medicine, New York, N.Y.

Filed Jul. 25, 1997, Appl. No. 900,347

Int. Cl.[7] **C12Q** *1/68;* **C12N** *15/63*

U.S. Cl. 435—6 **8 Claims**


EXAMPLE: USE OF INVENTION FOR PRODUCTION OF A SECRETORY PROTEIN cDNA LIBRARY
(I) CONSTRUCTION OF AN ENRICHED cDNA LIBRARY
(II) PRODUCTION OF ANTISERUM AGAINST SECRETORY PROTEINS
ISOLATE mRNA FROM ROUGH MICROSOMES (ENRICHED FOR mRNA's ENCODING SECRETORY AND MEMBRANE PROTEINS)
PREPARE ANTISERUM VS. SECRETED PROTEINS
(ADSORPTION WITH CELLULAR PROTEINS)
GENERATION OF A cDNA EXPRESSION LIBRARY
ANTISERUM SPECIFIC FOR SECRETED PROTEINS
(III) SCREEN THE EXPRESSION LIBRARY WITH THE ANTISERUM
ENCODING SECRETORY PROTEIN cDNAs

1. A method of preparing a gene expression library enriched for genes encoding secretory proteins comprising the steps of (i) preparing a cDNA expression library consisting of cDNA clones produced from mRNA collected from rough microsomes of a secretory tissue; (ii) screening the cDNA expression library with a polyclonal antiserum directed toward proteins secreted by the tissue; and (iii) pooling cDNA clones reactive with the antiserum.

6,040,145

POTENTIATION OF THE IMMUNE RESPONSE

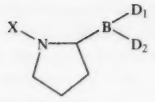
Brigitte T. Huber, Boston; Tracy Schmitz, Cambridge, and Robert Underwood, Quincy, all of Mass., assignors to Tufts University, Boston, Mass.

Filed May 7, 1997, Appl. No. 852,395

Int. Cl.[7] **G01N** *33/53;33/567;* **A61K** *38/48*

U.S. Cl. 435—7.2 **7 Claims**

1. A method for stimulating proliferation of T-cells of a human patient; said method comprising contacting said T-cells, in vitro, with an organic compound having the structure:



wherein B is boron, each D1 and D2 independently, is a hydroxyl group or a group which is capable of being hydrolyzed to a hydroxyl group in aqueous solution at physiological pH; and X comprises an amino acid or a peptide which mimics the site of a substrate recognized by a post-prolyl cleaving enzyme; at an in vitro concentration below 10^{-8}M, wherein said compound inhibits the post-prolyl cleaving dipeptidase activity present in the cytoplasm of Jurkat cells and said patient suffers from a disease state caused by HIV infection.

6,040,146

DETECTION OF MAMMARY TUMOR VIRUS-LIKE SEQUENCES IN HUMAN BREAST CANCER

Beatriz Pogo, Pelham, and James Holland, Scarsdale, both of N.Y., assignors to Mount Sinai School of Medicine, New York, N.Y.

Continuation-in-part of application No. 08/555,394, Nov. 9, 1995, Pat. No. 5,686,247. This application Nov. 8, 1996, Appl. No. 745,892.

Int. Cl.[7] **G01N** *33/574;* **C07K** *16/10;16/30*

U.S. Cl. 435—7.23 **12 Claims**

3. An antibody which specifically binds to a peptide encoded by a nucleic acid which hybridizes, under stringent conditions, to a nucleic acid having a sequence as set forth in SEQ ID NO: 17, as occurs between residues 976 and 1640 of the mouse mammary tumor virus env gene, and which does not hybridize to any other region of the mouse mammary tumor virus genome.

6,040,147

SYSTEMIC INFLAMMATORY MARKERS AS DIAGNOSTIC TOOLS IN THE PREVENTION OF ATHEROSCLEROTIC DISEASES AND AS TOOLS TO AID IN THE SELECTION OF AGENTS TO BE USED FOR THE PREVENTION AND TREATMENT OF ATHEROSCLEROTIC DISEASE

Paul Ridker, Chestnut Hill, and Charles H. Hennekens, South Natick, both of Mass., assignors to The Brigham and Women's Hospital, Inc., Boston, Mass.

Provisional application No. 60/043,039, Apr. 2, 1997, Provisional application No. 60/041,950, Apr. 2, 1997, Provisional application No. 60/070,894, Jan. 9, 1998. This application Apr. 2, 1998, Appl. No. 54,212.

Int. Cl.[7] **G01N** *33/53;33/68*

U.S. Cl. 435—7.24 **47 Claims**

1. A method for characterizing an apparently healthy, nonsmoking individual's risk profile of developing a future myocardial infarction, comprising obtaining a level of a marker of systemic inflammation in the individual,

comparing the level of the marker to a predetermined value, and

characterizing the individual's risk profile of developing a future myocardial infarction based upon the level of the marker in comparison to the predetermined value.

6,040,148

CORYNEBACTERIAL STRESS PROTEINS

Peter James Burnie, Alderley Edge, United Kingdom, assignor to The Victoria University of Manchester, United Kingdom

Continuation of application No. 07/842,347, filed as application No. PCT/GB91/01252, Jul. 25, 1991, abandoned. This application Mar. 22, 1995, Appl. No. 409,901.

Claims priority, application United Kingdom, Jul. 25, 1990, 9016315

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G01N** *33/569;* **C07K** *14/34;7/00;* **A61K** *39/05*

U.S. Cl. 435—7.32 **7 Claims**

5. A diagnostic test kit for bacterial infection comprising in a container a purified Corynebacterial stress protein having an apparent molecular weight of about 86 Kd, said stress protein having the following features:

(1) being an antigen;

(2) inducing in patients with *Corynebacterium jeikeium* septicemia on recovery antibody to a 52 Kd breakdown product of the stress protein;

(3) inducing in patients with *Corynebacterium jeikeium* endocarditis antibody to a 52 Kd breakdown product of the stress protein;

(4) being cross reactive with a mouse monoclonal antibody against a peptide antigen KVIRKNIVKKMIE (SEQ ID NO: 1); and

(5) cross-reaction of the stress protein with said mouse monoclonal antibody is neutralized by peptide KVIRKNIVKKMIE (SEQ ID NO: 1).

6,040,149

ASSAY FOR IDENTIFYING AGENTS WHICH ACT ON THE CERAMIDE-ACTIVATED PROTEIN KINASE, KINASE SUPPRESSOR OF RAS, AND METHODS OF USING SAID AGENTS

Richard N. Kolesnick, New York, N.Y.; Jun Liu, Boston, Mass., and Yuhua Zhang, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Provisional application No. 60/009,900, Jan. 11, 1996. This application Jan. 10, 1997, Appl. No. 785,247.

Int. Cl.[7] **C12Q** *1/48;* **C12N** *9/12;* **A61K** *38/51*

U.S. Cl. 435—15 **3 Claims**

1. A method of determining whether an agent is capable of specifically inhibiting the ability of lipopolysaccharide to stimulate phosphorylation of the threonine residue in a Thr-Pro- or a Thr-Leu-Pro-containing polypeptide by a ceramide-activated protein kinase having a molecular weight of about 100–110 kD, which comprises:

(a) incubating the protein kinase with a reaction mixture containing a predetermined amount of a polypeptide capable of being specifically phosphorylated by the protein kinase, a predetermined amount of lipopolysaccharide, and the agent, under conditions (I) which would permit activity of the protein kinase to be linear with respect to time, lipopolysaccharide concentration and protein kinase concentration in the absence of the agent, and (ii) which would permit the specific phosphorylation by the protein kinase of a predetermined number of the threonine residues in such predetermined amount of the polypeptide in the absence of the agent;

(b) quantitatively determining the percentage of such predetermined number of threonine residues which are specifically phosphorylated in the presence of the agent, thereby determining whether the agent is capable of inhibiting the ability of lipopolysaccharide to stimulate the phosphorylation activity of the ceramide-activated protein kinase; and

(c) determining whether the agent inhibits the ability of a non-lipopolysaccharide agent to stimulate the phosphorylation activity of the ceramide-activated protein kinase, the non-lipopolysaccharide agent being known to stimulate the activity in the absence of the agent, so as to determine whether the agent is capable of specifically inhibiting the ability of

lipopolysaccharide to stimulate the phosphorylation activity of the ceramide-activated protein kinase.

6,040,150

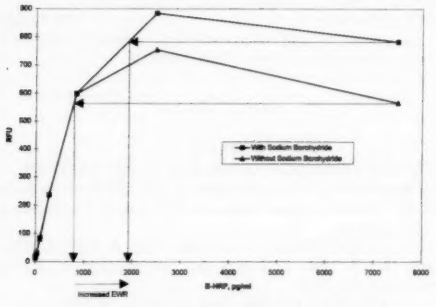
FORMULATIONS FOR FLUOROGENIC PEROXIDASE ASSAYS

M. Dean Savage, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed Dec. 8, 1998, Appl. No. 206,878

Int. Cl.[7] C12Q *1/28;1/00;* **G01N** *33/53;21/76*

U.S. Cl. 435—28 **5 Claims**



1. In the method of assaying for peroxidase or peroxide activity comprising reacting a substrate solution containing a fluorogenic phenolic compound with peroxidase in the presence of hydrogen peroxide and measuring the resulting fluorescence intensity, the improvement comprising including in said assay, in an amount sufficient to enhance the effective working range of said assay, a boron acid or salt thereof, or a phosphine-based or hydride-based reducing agent.

6,040,151

DIAGNOSTIC COMPOSITIONS AND DEVICES UTILIZING SAME

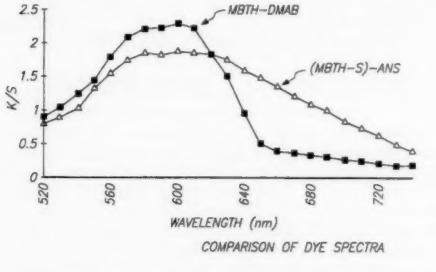
Joel S. Douglas, Santa Clara, and Karen R. Drexler, Los Altos Hills, both of Calif., assignors to Mercury Diagnostics, Inc., Scotts Valley, Calif.

Continuation of application No. 09/037,653, Mar. 10, 1998, Pat. No. 5,885,790. This application Mar. 22, 1999, Appl. No. 273,532.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12Q *1/28;1/26;1/00*

U.S. Cl. 435—28 **18 Claims**



COMPARISON OF DYE SPECTRA

1. A composition for a dry chemistry reagent indicator comprising:

3-Methyl-6-(M sulfonate)-benzothiazolinone-(2)-hydrazone, wherein M is a positive charge ion providing a stable aqueous salt thereof;

a second dye component selected from the group consisting of 3,3-dimethylaminobenzoic acid, 3,5-dichloro-2-hydroxybenzenesulfonic acid, 8-anilino-1-naphthalenesulfonate and N-(3-sulfopropyl)aniline; and

glucose oxidase.

6,040,152

METHOD AND ASSAY FOR REGULATION OF T CELL PROLIFERATION

Abraham Kupfer; Hannah Kupfer, both of Denver, and Colin R. F. Monks, Idaho Springs, all of Colo., assignors to National Jewish Medical and Research Center, Denver, Colo.

Filed Dec. 31, 1996, Appl. No. 775,310

Int. Cl.[7] C12Q *1/02*

U.S. Cl. 435—29 **12 Claims**

1. An assay for evaluating the ability of a T cell to proliferate in response to an antigen-specific stimulus, comprising:

(a) culturing a T cell, having a T cell receptor, with an antigen presenting cell, having an MHC-antigen complex comprising an MHC protein and an antigen, wherein said antigen is bound to an antigen binding site of said MHC protein; and

(b) determining whether protein kinase C theta (PKCθ) is selectively activated in said T cell such that PKCθ, and no other of six known isoforms of PKC in T cells, translocates to a site of contact between said T cell and said antigen presenting cell.

6,040,153

CARTRIDGE AS WELL AS AIR ANALYSIS METHOD AND APPARATUS USING IT

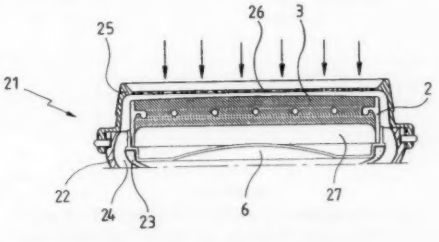
Jean Lemonnier, Paris, France, assignor to Millipore Corporation, Bedford, Mass.

Filed Mar. 31, 1999, Appl. No. 283,002

Claims priority, application France, Apr. 24, 1998, 98 05 166

Int. Cl.[7] C12Q *1/24;* **C12M** *3/00*

U.S. Cl. 435—30 **20 Claims**



1. A cartridge for culturing microorganisms comprising a cartridge having a body with a grid and an annular wall oriented transversely to said grid and surrounding it, and having a layer of growth media oriented parallel to said grid and coating it; a flexible fluid-tight film tensioned over an end surface of the annular wall and delimiting an end surface of said layer of growth media, a removable cover adapted to wedge said film between the external surface of said annular wall and an internal surface of a lateral wall of said cover and a removable base adapted to fit onto said body opposite said film.

6,040,154

PROCESS FOR BACTERIAL TREATMENT OF EFFLUENTS THAT CONTAIN ETHYL-TERT-BUTYL ETHER

Francoise Fayolle, Clamart; Francoise Le Roux, Rueil Malmaison, and Jean-Paul Vandecasteele, Fiyrqyeyxm, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison Cedex, France

Filed Jul. 23, 1998, Appl. No. 120,841

Claims priority, application France, Jul. 23, 1997, 97 09455

Int. Cl.[7] C12P *39/00;* **B09B** *3/00*

U.S. Cl. 435—42 **16 Claims**

1. Process for treating aqueous effluents that contain ethyl-tert-butyl ether (ETBE) to reduce the ETBE concentration, characterized in that at least one bacterium that is selected from the group consisting of *Gordona terrae* CIP I-1889 and *Rhodococcus equi* CIP I-2053 is grown in the presence of said effluents and the ETBE that is contained in the effluents is degraded by the biomass of said bacteria that are thus produced.

6,040,155

MULTIFUNCTIONAL PROTEIN AND DNA SEQUENCE ENCODING SAME

John Kay, 1 Sycamore Tree Close, Radyr, Cardiff CF4 8RT, and Peter Kille, 9 Lisvane Street, Cathays, Cardiff CF2 4LH, both of United Kingdom

Filed Aug. 28, 1996, Appl. No. 705,875

Int. Cl.[7] C12N *1/21*

U.S. Cl. 435—69.1 **8 Claims**

1. An isolated nucleic acid encoding a protease enzyme having chymotrypsin activity which hybridizes under stringent conditions with a nucleic acid encoding residues 64 to 300 of SEQ ID NO:4, wherein stringent conditions include hybridizing in 50% formamide, 6× SSC, 5× Denhardt's reagent, 0.5% SDS, and 100 μg/ml denatured, fragmented, salmon sperm DNA, and washing with 0.2× SSC, 0.1% SDS at 68° C.

6,040,156

DNA ENCODING GLUCURONYLTRANSFERASE

Toshisuke Kawasaki, Hirakata, and Shogo Oka, Uji, both of Japan, assignors to Seikagaku Corporation, Tokyo, Japan

Filed Apr. 14, 1998, Appl. No. 59,369

Claims priority, application Japan, May 16, 1997, 9-127065

Int. Cl.[7] C12P *2/06;* **C12N** *9/10;* **C07H** *17/00*

U.S. Cl. 435—69.1 **15 Claims**

1. An isolated DNA encoding at least part of a glucuronyltransferase polypeptide consisting of amino acids 1 to 347 in SEQ ID NO:2, wherein the DNA encoding a polypeptide that is capable of transferring glucuronic acid from a glucuronic acid donor to glucuronic acid acceptor.

6,040,157

VASCULAR ENDOTHELIAL GROWTH FACTOR 2

Jing-Shan Hu, Sunnyvale, Calif.; Craig A. Rosen, Laytonsville, Md., and Liang Cao, South Horizons, The Hong Kong Special Administrative Region of the People's Republic of China, assignors to Human Genome Sciences, Inc., Rockville, Md.

Continuation-in-part of application No. 08/999,811, Dec. 24, 1997, Pat. No. 5,932,540, which is a continuation-in-part of application No. 08/824,996, Mar. 27, 1997, and a continuation-in-part of application No. 08/465,968, Jun. 6, 1995, which is a continuation-in-part of application No. 08/207,550, Mar. 8, 1994. This application Mar. 13, 1998, Appl. No. 42,105.

Int. Cl.[7] C12N *15/18;15/63;1/21;5/00*

U.S. Cl. 435—69.4 **75 Claims**

1. An isolated polynucleotide comprising a nucleic acid encoding amino acids +24 to +396 of SEQ ID NO:2.

6,040,158

PROCESS FOR PREPARING SUGAR NUCLEOTIDE

Kenji Takenouchi; Tomoki Hamamoto, and Toshitada Noguchi, all of Choshi, Japan, assignors to Yamasa Corporation, Chiba, Japan

PCT No. PCT/JP97/03021, § 371 Date May 5, 1998, § 102(e) Date May 5, 1998, PCT Pub. No. WO98/11248, PCT Pub. Date Mar. 19, 1998

PCT Filed Aug. 29, 1997, Appl. No. 68,198

Claims priority, application Japan, Sep. 11, 1996, 8-262470; Oct. 7, 1996, 8-284723; Jan. 23, 1997, 9-024348

Int. Cl.[7] C12P *19/30;19/40;19/32;19/26;19/00*

U.S. Cl. 435—89 **18 Claims**

1. A process for preparing uridine diphosphate-glucose (UDP-glucose), which comprises the steps of:

adding yeast cells and uridine monophosphates (UMP) to a reaction system and reacting therewith to produce uridine triphosphates (UTP), and then

deactivating the UTP synthesizing enzymes from the yeast cells when the production yield of UTP is maximized, and then

adding UDP-glucose pyrophosphorylases and glucose 1-phosphates to the UTP-containing reaction system, to produce UDP-glucose.

6,040,159

TNF-α RIBOZYMES AND DERIVATIVES CAPABLE OF DECREASING DEGRADATION OF MRNA IN VIVO

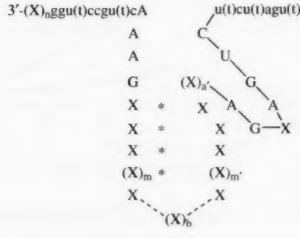
Mouldy Sioud, Oslo, Norway, assignor to Gene Shears Pty. Limited, Canberra, Australia

Continuation of application No. 07/971,058, Nov. 3, 1992, abandoned. This application Apr. 4, 1995, Appl. No. 416,516.

Int. Cl.[7] C12P *19/34;* **C07H** *21/04;* **C12N** *15/85;1/20*

U.S. Cl. 435—91.31 **10 Claims**

1. A compound having the structure (SEQ ID NO: 1):



wherein each X represents a ribonucleotide which is the same or different and may be modified in its phosphate;

wherein each of A, C, U, and G represents a ribonucleotide and a, c, u(t), and g represents a ribonucleotide or deoxyribonucleotide which may be modified in its phosphate;

wherein each of $(X)_n$ and $(X)_{n'}$ represents an oligonucleotide having a predetermined sequence;

wherein each of n and n' represents an integer;

wherein each * represents base pairing between the nucleotides located on either side thereof;

wherein each solid line represents a chemical linkage providing covalent bonds between the nucleotides located on either side thereof;

wherein a' represents an integer which defines a number of ribonucleotides with the proviso that a' may be 0 or 1 and if 0, the A located 5' of $(X)_{a'}$ is bonded to the X located 3' of $(X)_{a'}$;

wherein each of m and m' represents an integer which is greater than or equal to 1;

wherein each of the dashed lines independently represents either a chemical linkage providing covalent bonds between the nucleotides located on either side thereof or the absence of any such chemical linkage; and

wherein $(X)_b$ represents an oligonucleotide which may be present or absent with the proviso that b represents an integer which is greater than or equal to 2 if $(X)_b$ is present.

6,040,160

METHOD OF PRODUCING L-LYSINE BY FERMENTATION

Hiroyuki Kojima; Yuri Ogawa; Kazue Kawamura, and Konosuke Sano, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

PCT No. PCT/JP94/01994, § 371 Date May 29, 1996, § 102(e) Date May 29, 1996, PCT Pub. No. WO95/16042, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 28, 1994, Appl. No. 648,010

Claims priority, application Japan, Dec. 8, 1993, 5-308397

Int. Cl.[7] **C12P** *13/08;* **C12N** *1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—115 **22 Claims**

1. An isolated DNA coding for a dihydrodipicolinate synthase originating from a bacterium belonging to the genus Escherichia, wherein the dihydrodipicolinate synthase has a mutation which desensitizes feedback inhibition by L-lysine, wherein the mutation is selected from the group consisting of

(a) a mutation to replace the alanine residue at the 81st position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue,

(b) a mutation to replace the histidine residue at the 118th position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue, and

(c) a mutation to replace the alanine residue at the 81st position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue and replace the histidine residue at the 118th position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue,

(d) a mutation to replace the alanine residue corresponding to the 81st position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue,

(e) a mutation to replace the histidine residue corresponding to the 118th position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue, and

(f) a mutation to replace the alanine residue corresponding to the 81st position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue and replace the histidine residue corresponding to the 118th position as counted from the N-terminal in the amino acid sequence of the dihydrodipicolinate synthase of SEQ ID NO: 4 with another amino acid residue.

6,040,161

LOW SAFA OILS

Frederick William Cain, Voorburg, Netherlands; Paul Thomas Quinlan, bedford, and Stephen Raymond Moore, thrapston, both of United Kingdom, assignors to Loders Croklaan B.V., Wormerveer, Netherlands

Continuation of application No. 08/415,067, Mar. 31, 1995, abandoned. This application Dec. 30, 1996, Appl. No. 777,089.

Claims priority, application European Pat. Off., Mar. 31, 1994, 94302325

Int. Cl.[7] **C12P** *7/64;* **C12N** *9/20*

U.S. Cl. 435—134 **9 Claims**

1. Process for the production of liquid oils with a SAFA-content below 5 wt. %, which comprises reacting a triglyceride fatty compound (A) comprising at least a saturated and an unsaturated fatty acid moiety, with a reactant B comprising a polyhydroxy compound to form different non-triglyceride reaction products comprising diglycerides and mono-glycerides with different fatty acid composition (SU, SS and UU), which products have a different melting point and/or different solubility in compound A and decreasing the SAFA-level of liquid oil product by precipitating and removing the higher melting and/or less soluble non-triglyceride reaction products, the reactant B being selected from the group consisting of polyhydroxy compounds, long chain fatty alcohols (6–22 C-atoms); long chain unsaturated fatty acids or their esters and basic salts of inorganic cations and the reaction being performed by applying an enzyme.

6,040,162

HISTIDYL TRNA SYNTHETASE FROM *STREPTOCOCCUS PNEUMONIAE*

Daniel Robert Gentry, Pottstown; Rebecca Claire Greenwood, Berwyn, and Elizabeth Jane Lawlor, Malvern, all of Pa., assignors to Smithkline Beecham Corporation, Philadelphia, Pa.

Division of application No. 08/906,744, Aug. 6, 1997, Pat. No. 5,795,758, which is a continuation-in-part of application No. 08/844,055, Apr. 18, 1997, Pat. No. 5,747,313. This application Jun. 8, 1998, Appl. No. 93,134.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C12Q** *1/68;* **C12N** *9/00;15/00;* **A61K** *38/00;* **C07H** *21/04*

U.S. Cl. 435—183 **17 Claims**

1. An isolated polypeptide comprising an amino acid sequence having at least 95% identity with the amino acid sequence set forth in SEQ ID NO:2.

6,040,163

ASPARAGINYL TRNA SYNTHETASE FROM *STREPTOCOCCUS PNEUMONIAE*

Elizabeth Jane Lawlor, Malvern, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa., and SmithKline Beecham p.l.c., United Kingdom

Division of application No. 08/844,154, Apr. 18, 1997, Pat. No. 5,827,708. This application Jul. 30, 1998, Appl. No. 126,192.

Claims priority, application United Kingdom, Apr. 18, 1996, 9607993

Int. Cl.[7] **C12N** *9/00;15/00;* **C12Q** *1/68;* **C07H** *21/04*

U.S. Cl. 435—183 **22 Claims**

1. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) an amino acid sequence having at least 95% identity with the amino acid sequence set forth in SEQ ID NO:2; and,

(b) an amino acid sequence having at least 95% identity with the amino acid sequence set forth in SEQ ID NO:4.

6,040,164

NUCLEIC ACIDS ENCODING NUCLEAR DBF2-RELATED (NDR) KINASES

Brian Arthur Hemmings, Bettingen, and Thomas Anders Millward, Basel, both of Switzerland, assignors to Novartis AG, Basel, Switzerland

Division of application No. 08/860,150, filed as application No. PCT/EP95/05052, Dec. 20, 1995, Pat. No. 5,981,205. This application Jun. 22, 1999, Appl. No. 338,132.

Claims priority, application Germany, Dec. 22, 1994, 94810746

Int. Cl.[7] **C12N** *9/02;15/00;* **C12P** *21/06*

U.S. Cl. 435—189 **5 Claims**

1. An isolated nucleic acid encoding an Ndr protein kinase, wherein the Ndr protein kinase has at least 50% identity to the human Ndr protein having the same amino acid sequence depicted in SEQ ID NO. 2 or SEQ ID NO. 7, said Ndr protein kinase having serine/threonine kinase activity, calcium-dependent calmodulin minding activity, and nuclear localization activity.

6,040,165

MUTANT PRENYL DIPHOSPHATE SYNTHASE

Keishi Narita, Sendai; Chika Ishida, Aichi; Yoshie Takeuchi; Chikara Ohto, both of Toyota; Shinichi Ohnuma, and Tokuzo Nishino, both of Sendai, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 1, 1997, Appl. No. 886,466

Claims priority, application Japan, Jul. 3, 1996, 8-191635

Int. Cl.[7] **C12N** *9/10;1/20;1/00;* **C07H** *21/04*

U.S. Cl. 435—193 **6 Claims**

1. An isolated DNA molecule encoding a mutant prenyl diphosphate synthase having an amino acid sequence wherein the amino acid residue Tyr at position 81 of SEQ ID NO:1 is replaced with an amino acid selected from the group consisting of Gly, Ala, Ser and Met.

6,040,166

KITS FOR AMPLIFYING AND DETECTING NUCLEIC ACID SEQUENCES, INCLUDING A PROBE

Henry A. Erlich, Oakland; Glenn Horn, Emeryville; Randall K. Saiki, Richmond; Kary B. Mullis, La Jolla, and David H. Gelfand, Oakland, all of Calif., assignors to Roche Molecular Systems, Inc., Pleasanton, Calif.

Division of application No. 07/546,257, Jun. 28, 1990, abandoned, which is a division of application No. 07/063,647, Jun. 17, 1987, Pat. No. 4,965,188, which is a continuation-in-part of application No. 06/899,513, Aug. 22, 1986, abandoned, which is a continuation-in-part of application No. 06/839,331, Mar. 13, 1986, abandoned, and a continuation-in-part of application No. 06/828,144, Feb. 7, 1986, Pat. No. 4,683,195, which is a continuation-in-part of application No. 06/824,044, Jan. 30, 1986, abandoned, which is a division of application No. 06/791,308, Oct. 25, 1985, Pat. No. 4,683,202, which is a continuation-in-part of application No. 06/716,975, Mar. 28, 1985, abandoned. This application Sep. 27, 1994, Appl. No. 312,729.

Int. Cl.[7] **C12N** *9/12*

U.S. Cl. 435—194 **7 Claims**

1. A kit for the amplification of a nucleic acid, said kit comprising:

(a) first and second oligonucleotide primers, said oligonucleotide primers differing in sequence from each other;

(b) an oligonucleotide probe that differs in sequence from said first and second oligonucleotide primers; and

(c) a DNA polymerase enzyme.

6,040,167

SYNTHETIC MEMBRANE VESICLES CONTAINING FUNCTIONALLY ACTIVE FUSION PEPTIDES AS DRUG DELIVERY SYSTEMS

Reinhard Glück, Spiegel bei Bern; Peter Klein, Langenbruck; Peter Herrmann, Liestal, and Ernst Rudolf Wälti, Münchenbuchsee, all of Switzerland, assignors to Nika Health Products Limited, Liechtenstein

PCT No. PCT/EP92/00089, § 371 Date Nov. 2, 1992, § 102(e) Date Nov. 2, 1992, PCT Pub. No. WO92/13525, PCT Pub. Date Aug. 20, 1992

PCT Filed Jan. 17, 1992, Appl. No. 930,593

Claims priority, application European Pat. Off., Feb. 2, 1991, 91101414

Int. Cl.[7] **C12N** *7/00;* **A61K** *9/127;39/395;* **C07K** *14/11*

U.S. Cl. 435—235.1 **39 Claims**

1. A phospholipid bilayer vesicle having at least one desired drug or pharmaceutically active substance therein, said vesicle comprising:

(a) a membrane having one or more viral phospholipids in combination with other phospholipids comprising phosphatidylethanolamine (PE);

(b) at least one active fusion peptide that is a non-Sendai viral hemagglutinin that causes the vesicles to be internalized by target cells through phagocytosis or endocytosis, said hemagglutinin being attached directly or indirectly to said membrane;

(c) a bifunctional crosslinker linked to phosphatidylethanolamine (PE) of said membrane; and

(d) at least one cell-specific marker linked via its sulphur to the PE-bound crosslinker, said marker being a biologically active protein for binding to a receptor of target cells.

6,040,168

DNA ENCODING THE HUMAN SYNAPSIN III GENE AND USES THEREOF

Paul Greengard; Barbara Porton, and Hung-Teh Kao, all of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Aug. 6, 1997, Appl. No. 906,865

Int. Cl.[7] **C12N** *15/85;1/21;15/63;* **C07H** *21/04*

U.S. Cl. 435—235.1 **8 Claims**

1. An isolated and purified DNA molecule comprising a DNA sequence which encodes a synapsin III comprising an amino acid sequence of FIG. **4** (SEQ ID NO:1), wherein said isolated and purified DNA molecule comprises a DNA sequence selected from the group consisting of:

(A) the DNA sequence of FIG. **4** (SEQ ID NO:2); and

(B) a degenerate variant of the DNA sequence of FIG. **4** (SEQ ID NO:2).

6,040,169

HERPES SIMPLEX VIRUS-1 DELETION VARIANTS AND VACCINES THEREOF

Susanne Moira Brown, and Alasdair Roderick MacLean, both of Glasgow, United Kingdom, assignors to Medical Research Council, London, United Kingdom

Continuation of application No. 08/439,042, May 11, 1995, abandoned, which is a continuation of application No. 08/094,047, filed as application No. PCT/GB92/00179, Jan. 30, 1992, abandoned. This application Dec. 13, 1996, Appl. No. 766,840.

Claims priority, application United Kingdom, Jan. 31, 1991, 9102126

Int. Cl.[7] C12N *7/04*

U.S. Cl. 435—236 **2 Claims**

1. A variant of HSV-1 strain 17 which is HSV-1 1716 (ECACC V92012803).

6,040,170

HUMAN CYTOMEGALOVIRUS DNA SEQUENCES

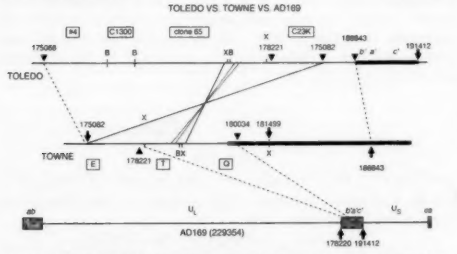
Richard Spaete, Belmont, and Tai-An Cha, San Ramon, both of Calif., assignors to Aviron, Mountain View, Calif.

Division of application No. 08/926,922, Sep. 10, 1997, Pat. No. 5,925,751, which is a division of application No. 08/414,926, Mar. 31, 1995, Pat. No. 5,721,354. This application Feb. 18, 1999, Appl. No. 253,682.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *1/20;15/00;* **C07H** *21/04;* **C12Q** *1/70*

U.S. Cl. 435—252.3 **10 Claims**



1. An isolated DNA sequence comprising at least one complete open reading frame of SEQ ID NO:6.

6,040,171

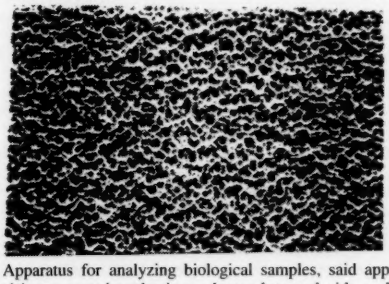
APPARATUS FOR ANALYZING BIOLOGICAL SAMPLES

Zonh-Zen Ho, Hacienda Heights; Tomasz P. Jannson, Torrance; Robert A. Lieberman, Torrance; Gajendra D. Savant, Torrance, and Allan Wang, Torrance, all of Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Aug. 21, 1998, Appl. No. 138,240

Int. Cl.[7] C12M *3/00*

U.S. Cl. 435—288.1 **12 Claims**



1. Apparatus for analyzing biological samples, said apparatus comprising a container having a base plate and side walls for forming a receptacle for said sample, said base plate having a first surface for receiving a sample, said surface having a distribution of features operative to redirect light incident thereto into a controlled pattern with smooth brightness variation.

6,040,172

DEFECTIVE DNA VIRAL VECTOR COMPRISING A NEURAL TISSUE-SPECIFIC PROMOTER FOR IN VIVO EXPRESSION OF A GENE

Michael G. Kaplitt, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.

PCT No. PCT/US93/07685, § 371 Date Feb. 14, 1995, § 102(e) Date Feb. 14, 1995, PCT Pub. No. WO94/04695, PCT Pub. Date Mar. 3, 1994

Continuation-in-part of application No. 07/930,875, Aug. 14, 1992, abandoned. This PCT application Aug. 16, 1993, Appl. No. 381,924.

Int. Cl.[7] C12N *15/63;15/00;15/09;5/00*

U.S. Cl. 435—320.1 **21 Claims**

1. A replication defective DNA viral vector for the in vivo expression of a gene of interest in a mammalian host cell, wherein said vector comprises the gene of interest in operable linkage with a neural tissue-specific promoter such that said gene of interest is expressed in said host cell, wherein said neural tissue-specific promoter is a promoter of a gene encoding a protein normally produced by said host cell, and wherein said defective DNA viral vector entirely or almost entirely lacks viral genes.

6,040,173

NUCLEIC ACID ENCODING A NOVEL MAMMALIAN PROTEIN ASSOCIATED WITH UNCONTROLLED CELL DIVISION

Gary R. Pasternack, Baltimore, Md., assignor to Johns Hopkins University, Baltimore, Md.

Continuation of application No. 08/314,503, Sep. 28, 1994, Pat. No. 5,734,022, and a division of application No. 07/995,930, Dec. 24, 1992, abandoned, which is a continuation of application No. 07/561,989, Aug. 1, 1990, abandoned. This application Jun. 6, 1995, Appl. No. 466,743.

Int. Cl.[7] C12N *15/00;* **C07H** *21/04*

U.S. Cl. 435—320.1 **4 Claims**

1. An expression vector comprising a sequence of at least 18 contiguous nucleotides selected from the sequence of SEQ ID NO:1 or its complement under control of a promoter.

6,040,174

DEFECTIVE ADENOVIRUSES AND CORRESPONDING COMPLEMENTATION LINES

Jean-Luc Imler, Strasbourg; Majid Mehtali, Illkirch-Graffenstaden, and Andréa Pavirani, Strasbourg, all of France, assignors to Transgene S.A., Strasbourg, France

PCT No. PCT/FR94/00624, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO94/28152, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Appl. No. 379,452

Claims priority, application France, May 28, 1993, 93 06482

Int. Cl.[7] C12N *5/10;15/86;15/34*

U.S. Cl. 435—325 **19 Claims**

1. A complementation line comprising a complementation element for complementing in trans a defective adenoviral vector,

wherein said complementation element is either integrated into the chromosomal genome of said complementation line or inserted into an expression vector and said complementation element comprises a fragment of an adenoviral genome lacking an adenoviral 5'ITR and encoding an E1A gene product, wherein the E1A gene product is expressed under control of:

a) an E1 promoter or a heterologous promoter when the complementation line is made from a human embryonic retinal cell or A549 cell;
b) an E1 promoter or a heterologous promoter when the complementation line is made by cotransfection of the expression vector comprising the complementation element and the defective adenoviral vector; or
c) an inducible heterologous promoter.

6,040,175

AMPA-BINDING HUMAN GLUR2 RECEPTORS

Rajender Kamboj, Mississauga; Candace E. Elliott, and Stephen L. Nutt, both of Etobicoke, all of Canada, assignors to Allelix Biopharmaceuticals, Inc., Mississauga, Canada

Division of application No. 08/242,344, May 13, 1994, which is a continuation of application No. 07/896,437, Jun. 10, 1992, abandoned. This application Jun. 7, 1995, Appl. No. 483,327.

Int. Cl.[7] **C07K** *14/705;* **C12N** *5/10*

U.S. Cl. 435—325 **9 Claims**

1. A membrane preparation derived from a host cell, said host cell having incorporated expressibly therein a heterologous polynucleotide that encodes human GluR2B receptor selected from the group consisting of: (a) the sequence of amino acids 1–863 of SEQ ID NO:2, (b) a human GluR2B receptor variant having a sequence of amino acids 1–863 of SEQ ID NO:2 with the exception that there are from 1–32 conservative amino acid substitutions, (c) a membrane-bound fragment of the human GluR2B receptor of (a) or (b) comprising the extracellular N-terminal region that precedes TM-1, and (d) a membrane-bound fragment of the human GluR2B receptor of (a) comprising the extracellular C-terminal region that follows TM-4.

6,040,176

ANTIBODIES TO ICAM-RELATED PROTEIN

W. Michael Gallatin, and Rosemay Vazeux, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation of application No. 08/286,754, Aug. 5, 1994, abandoned, which is a continuation-in-part of application No. 08/102,852, Aug. 5, 1993, abandoned, which is a continuation-in-part of application No. 08/009,266, Jan. 22, 1993, abandoned, which is a continuation-in-part of application No. PCT/US93/00787, Jan. 26, 1993, which is a continuation-in-part of application No. 07/894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of application No. 07/889,724, May 26, 1992, abandoned, which is a continuation-in-part of application No. 07/827,689, Jan. 27, 1992, abandoned. This application Sep. 12, 1996, Appl. No. 714,017.

Int. Cl.[7] **C12N** *5/00;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 435—326 **3 Claims**

1. A monoclonal antibody produced by the hybridoma cell line 81K2F (ATCC HB 11692).

6,040,177

HIGH EFFICIENCY TRANSDUCTION OF T LYMPHOCYTES USING RAPID EXPANSION METHODS ("REM")

Stanley R. Riddell, Bothell, and Philip D. Greenberg, Mercer Island, both of Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Division of application No. 08/317,100, Oct. 3, 1994, which is a continuation of application No. 08/299,930, Aug. 31, 1994, abandoned, and a continuation of application No. PCT/US95/11182, Aug. 31, 1995, abandoned. This application Mar. 13, 1996, Appl. No. 614,585.

Int. Cl.[7] **C12N** *5/10;15/11;* **C07K** *14/55;16/28*

U.S. Cl. 435—372.3 **24 Claims**

1. A method of genetically transducing a T cell, comprising:
(a) adding initial isolated T lymphocytes to a culture medium in vitro, said T lymphocytes comprising a T cell receptor complex, wherein said T lymphocytes are isolated by use of an affinity reagent that selects antigen-specific T cells or are isolated by limiting dilution culture of antigen-stimulated T lymphocytes;
(b) adding to the culture medium a disproportionately large number of non-dividing peripheral blood mononuclear cells (PBMC) as feeder cells such that the resulting population of cells contains a ratio of at least about 40 PBMC feeder cells for each T lymphocyte in the initial population to be expanded;
(c) activating said T cell receptor complex;
(d) adding a transduction vector to said culture medium;
(e) incubating the culture, thereby producing a population of transduced T lymphocytes which become reversibly quiescent upon withdrawal of exogenous cytokine and are antigen-specific and MHC restricted.

6,040,178

ANTISENSE INHIBITION OF SMAD5 EXPRESSION

Brett P. Monia, La Costa, and Lex M. Cowsert, Carlsbad, both of Calif., assignors to Isis Pharmaceuticals Inc., Carlsbad, Calif.

Filed Feb. 23, 1999, Appl. No. 256,492

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C07H** *21/04;* **C12Q** *1/68;* **C12N** *15/00*

U.S. Cl. 435—375 **20 Claims**

1. An antisense compound 8 to 30 nucleobases in length targeted to a coding region or 5'UTR of a nucleic acid molecule encoding human Smad5, wherein said antisense compound inhibits the expression of human Smad5, with the proviso that said antisense compound is not complementary to bases 133 to 145 of human Smad5 (SEQ ID NO: 1).

6,040,179

ANTISENSE INHIBITION OF G-ALPHA-I2 EXPRESSION

Lex M. Cowsert, Carlsbad, Calif., assignor to Isis Pharmaceuticals Inc., Carlsbad, Calif.

Filed Jun. 25, 1999, Appl. No. 339,993

Int. Cl.[7] **C07H** *21/04;* **C12Q** *1/68;* **C12N** *15/85*

U.S. Cl. 435—375 **13 Claims**

1. An antisense oligonucleotide up to 30 nucleobases in length targeted to a nucleic acid molecule encoding human G-alpha-i2 comprising at least an 8 nucleobase portion of SEQ ID NO: 8, 12, 10, 14, 15, 16, 17, 19, 20, 18, 21, 22, 23, 24, 25, 29, 30, 31, 32, 33, 34, 38, 36, 41, 43, 44, 45, 46, 47, 11, 27, 28, 37 or 42 and which inhibits expression of human G-alpha-i2.

6,040,180

IN VITRO GENERATION OF DIFFERENTIATED NEURONS FROM CULTURES OF MAMMALIAN MULTIPOTENTIAL CNS STEM CELLS

Karl K. Johe, Potomac, Md., assignor to NeuralStem Biopharmaceuticals, Ltd., College Park, Md.

Continuation-in-part of application No. 08/719,450, Sep. 25, 1996, Pat. No. 5,753,506, Provisional application No. 60/018,206, May 23, 1996. This application May 7, 1997, Appl. No. 919,580.

Int. Cl.[7] **C12N** *5/06*

U.S. Cl. 435—377 **6 Claims**

1. A method for in vitro generation of neurons, astrocytes and oligodendrocytes from an adhesion culture of mammalian multipotential CNS stem cells, wherein the mammalian multipotential CNS stem cells maintain the multipotential capacity to differentiate into neurons, astrocytes and oligodendrocytes, divide in serum-free medium supplemented with a mitogen and differentiate upon withdrawal of mitogen, comprising the steps of:

a) culturing multipotential CNS stem cells in a chemically defined serum-free culture medium containing a growth factor by:
1) dissociating cells from central nervous system tissue by mechanical trituration in the absence of divalent cations,
2) culturing the dissociated cells adhered onto a plate in a chemically defined serum-free culture medium,
3) plating dissociated cells at a density not exceeding 20,000 cells/cm^2 and, in subsequent passages, replating the cultured cells at a density not exceeding 10,000 cells/cm^2,
4) adding daily to the cultured cells a growth factor selected from the group consisting of
i) bFGF at a concentration of at least 10 ng/ml,
ii) EGF at a concentration of at least 10 ng/ml,
iii) TGF-alpha at a concentration of at least 10 ng/ml, and
iv) aFGF at a concentration of at least 10 ng/ml plus 1 μg/ml heparin,
5) replacing the culture medium with fresh medium within every two days,
6) passaging the cultured cells within four days after plating so as not to exceed 50% confluence, and
7) passaging the cultured cells by treating the cultured cells with saline solution free of divalent cations and scraping cells from the plate;
b) replacing the medium with growth factor-free, serum-free medium;
c) harvesting the stem cells;
d) plating the stem cells at a density of between 100,000 to 250,000 cells per square centimeter; and
e) culturing the cells in a glutamic acid-free chemically defined serum-free culture medium.

6,040,181

REGULATION OF BCL-2 GENE EXPRESSION

John C. Reed, Carlsbad, Calif., assignor to University of Pennsylvania, Philadelphia, Pa.

Continuation of application No. 08/465,485, Jun. 5, 1995, Pat. No. 5,831,066, which is a continuation of application No. 08/124,256, Sep. 20, 1993, abandoned, which is a continuation-in-part of application No. 07/840,716, Feb. 21, 1992, abandoned, which is a continuation-in-part of application No. 07/288,692, Dec. 22, 1988, abandoned. This application May 18, 1998, Appl. No. 80,285.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C12Q** *1/68;* **A61K** *48/00;* **C07H** *21/02;21/04*

U.S. Cl. 435—377 **21 Claims**

1. A method for increasing the sensitivity of tumor cells to chemotherapeutic agents, wherein said cells express the human bcl-2 gene consisting of the nucleic acid sequence of SEQ ID NO:19, comprising the step of introducing an anticode oligomer to said tumor cells to reduce bcl-2 expression in said tumor cells, wherein said anticode oligomer (i) binds to pre-mRNA or mRNA expressed from said bcl-2 gene and (ii) reduces bcl-2 expression.

6,040,182

METHOD AND MATERIALS FOR EFFICIENCY PROTEIN IMMOBILIZATION ON TISSUE CULTURE TREATED ASSAY PLATES

Michael Septak, Ashland, Mass., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 12, 1997, Appl. No. 969,081

Int. Cl.[7] **C12N** *5/00*

U.S. Cl. 435—395 **48 Claims**

1. A method for achieving efficient and stable protein coating on plasma treated plastic surfaces wherein said method comprises:
(a) coating a plasma treated plastic surface with a coating solution wherein said coating solution comprises a protein or polypeptide to be immobilized in a concentration of about 1 ng/mL to about 2000 ng/mL, in a coating buffer, wherein said coating buffer has a buffer species dissolved in distilled or deionized water in a concentration of about 2 mM to about 500 mM and the pH of the coating buffer is from about 6 to about 8;
(b) incubating said coating solution on said plasma treated plastic surface;
(c) washing the plastic surface to remove any extraneous materials not firmly attached to the plastic surface;
(d) drying the plastic surface having the coating solution thereon; and
(e) obtaining a plasma treated plastic surface having a protein efficiently and stably bound thereto.

6,040,183

HELPER VIRUS-FREE AAV PRODUCTION

Forrest K. Ferrari; Xiao Xiao, and Richard Jude Samulski, all of Chapel Hill, N.C., assignors to University of North Carloina at Chapel Hill, Chapel Hill, N.C.

Filed Jun. 7, 1995, Appl. No. 484,515

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C12N** *15/86*

U.S. Cl. 435—457 **9 Claims**

1. A method for producing substantially helper virus-free stocks of recombinant adeno-associated virus (rAAV) comprising:
(a) cotransfecting cells permissive for adenovirus-associated virus (AAV) replication with:
i) an rAAV vector which packages into infectious rAAV virions,
ii) a helper AAV vector which provides the AAV functions essential for the replication and packaging of said rAAV vector into infectious rAAV virions, and
iii) a helper virus vector which provides the helper viral functions essential for a productive AAV infection but which cannot itself be packaged into infectious helper virus virions,
wherein said vectors are maintained in said cells other than stably integrated in a cell chromosome;
(b) lysing said cells to produce a lysate containing rAAV virions substantially free of helper virus virions; and
(c) collecting said rAAV virions.

6,040,184

METHOD FOR MORE EFFICIENT ELECTROPORATION

Alan L. Greener, San Diego, Calif., and Bruce D. Jerpseth, Cedar Creek, Tex., assignors to Stratagene, La Jolla, Calif.

Provisional application No. 60/103,612, Oct. 9, 1998. This application Feb. 22, 1999, Appl. No. 253,703.

Int. Cl.[7] **C12N** *15/64*

U.S. Cl. 435—461 **45 Claims**

1. A method for transferring nucleic acids of interest into host cells, comprising:
(a) mixing competent host cells suspended in a substantially non-ionic solution comprising at least one sugar or sugar derivative, wherein the sugar derivative is selected from a ketose, amino sugar, glycoside, and lactone, with the nucleic acids of interest; and
(b) subjecting the host cells to an electrical treatment, thereby permitting the transfer of the nucleic acids of interest into the host cells.

6,040,185

GENETIC STABILIZING ELEMENTS

Paul S. Dietrich, Palo Alto, Calif.; Martinus Quirinus Joseph Marie Van Grinsven; Johannes Jacobus Ludgerus Gielen, both of Enkhuizen, Netherlands; Johannes Maria de Haas, Bovenkarspel, Netherlands, and Roeland Van Driel, Castricum, Netherlands, assignors to Novartis AG, Basel, Switzerland

Continuation of application No. 08/439,156, May 11, 1995, abandoned, which is a continuation of application No. 08/309,819, Sep. 21, 1994, abandoned, which is a continuation-in-part of application No. 08/049,564, Apr. 19, 1993, abandoned. This application Sep. 11, 1996, Appl. No. 713,569.

Claims priority, application WIPO, Apr. 18, 1994, PCT/EP94/01193

Int. Cl.[7] **C12N** *15/29;15/82*

U.S. Cl. 435—468 **14 Claims**

1. An isolated nucleic acid molecule comprising an exogenous gene, the exogenous gene comprising a promoter sequence and a coding sequence and at least one DNA segment comprising a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5, wherein the DNA segment is located in a 5'-flanking region upstream of the promoter sequence.

8. A method for transforming a plant cell comprising introducing into said plant cell the isolated nucleic acid of claim **1**.

6,040,186

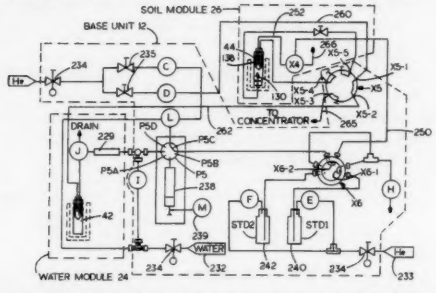
VIAL AUTOSAMPLER WITH SELECTABLE MODULES

Edmund T. Lewis, West Chester, and Thomas B. Green, Batavia, both of Ohio, assignors to Tekmar Company, Cincinnati, Ohio

Division of application No. 08/735,485, Oct. 23, 1996, which is a continuation of application No. 08/273,537, Jul. 11, 1994, abandoned. This application Apr. 24, 1997, Appl. No. 842,317.

Int. Cl.[7] **G01N** *35/10*

U.S. Cl. 436—53 **3 Claims**



3. A method of sampling a liquid sample from a first module of an autosampling device, and a gaseous sample from a second module of the autosampling device, comprising the steps of:

providing first and second sampling modules, said modules having first and second sources of samples, respectively;

providing a valve and conduit assembly including a first valve portion comprising a first multi port valve having a valve block movable to selected positions to connect ports including a first port connected by a conduit to the first module, and a second port connected through a second valve portion and conduits to the second module the valve block including a channel that is movable to a position to be filled with a standard;

selectively operating the first multi port selector valve to connect the channel to a standard source and to the first sample source and transfer a first sample and the standard to a remote instrument;

providing a second multi port valve and coupling the second multi port valve to a source of gas under pressure and in a first position the first module and purging portions of the first module while fluidly isolating the second module from the first module;

moving the second multi port valve to a second position when a second sample is to be tested and connecting the source of gas under pressure to the second module, while fluidly isolating the first module from the second module, and to transfer the second sample from the second sample source of the second module to the remote instrument, while maintaining the fluid isolation of the first module from the second module;

moving the channel of the valve block to the position to be filled with the standard; and

selectively operating the first multiport selector valve to connect the channel to the standard source and to the second sample source and transfer the second sample and the standard to the remote instrument.

6,040,187

METHOD OF DETERMINING THE SUPPRESSOR CELL COMPONENT OF HUMAN IMMUNE STATUS AND A MEANS FOR THE REALIZATION THEREOF

Ivan Nikolaevich Golovistikov, Russian Federation, Moscow, Donbasskaya str., 5, ap.51; Leonid Yazonovich Kacharava, Georgia, Tbilici, Mirtskhulava str., 2 ap.45, and Khallar Abdumuslimovich Alikhanov, Moscow, all of Russian Federation, assignors to Ivan Nikolaevich Golovistikov, Moscow, and Leonid Yazonovich Kacharava, Tbilici, both of Russian Federation

PCT No. PCT/RU95/00046, § 371 Date Jan. 21, 1997, § 102(e) Date Jan. 21, 1997, PCT Pub. No. WO95/25956, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 16, 1995, Appl. No. 716,138

Claims priority, application Russian Federation, Mar. 18, 1994, 94008170

Int. Cl.[7] **G01N** *33/48*

U.S. Cl. 436—63 **13 Claims**

1. A method for determining a suppressor component of a patient's immune status comprising:

(a) preparing first and second suspensions comprising mononuclear cells of the patient;

(b) cultivating the mononuclear cells of the first suspension with a suppressor activator consisting essentially of trophoblastic β-1 glycoprotein (TBG) in an amount effective to induce activation of suppressors in the mononuclear cells of the first suspension;

(c) cultivating the mononuclear cells of the second suspension without a suppressor activator;

(d) blocking proliferation of the mononuclear cells in each of the first and second suspensions;

(e) adding responder cells to each of the first and second suspensions in equal amounts so as to obtain respective first and second test cultures;

(f) cultivating the first and second test cultures under conditions that cause the responder cells to proliferate; and

(g) determining the suppressor component of the immune system of the patient by comparing respective proliferation of the responder cells in the first and second test cultures and assessing the suppressor component based on the extent, if any, that proliferation of the responder cells of the first test culture is lower than proliferation of the responder cells of the second test culture.

6,040,188

IN VITRO GASTROINTESTINAL MIMETIC PROTOCOL FOR MEASURING BIOAVAILABLE CONTAMINANTS

Hoi-Ying N. Holman, Berkeley, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Provisional application No. 60/066,169, Nov. 18, 1997. This application Nov. 18, 1998, Appl. No. 196,618.

Int. Cl.[7] **G01N** *33/92*

U.S. Cl. 436—71 **5 Claims**

1. A method for measuring hydrocarbon contaminants in an environmental sample comprising the steps of:

a) processing said sample to exclude particles over 1–10 mm in diameter;

b) preparing a mixture of lipids and bile salts so as to form micelles; then

c) adding said processed sample to the mixture to form a sample-lipid-bile salt mixture composition;

d) holding the sample-lipid-bile salt mixture composition at a temperature between 20 and 40° C. for 2 to 12 hrs wherein the sample-lipid-bile salt mixture composition separates into a liquid phase and a solid phase; then

e) separating the liquid phase from said solid phase of said sample-lipid-bile salt mixture composition; and

f) measuring the amount of said hydrocarbon contaminants in said liquid phase, whereby the measurement of said hydrocarbon contaminants in said liquid phase represents a fraction of said hydrocarbon contaminants in the environmental sample which would be taken up through oral ingestion of the environmental sample.

6,040,189

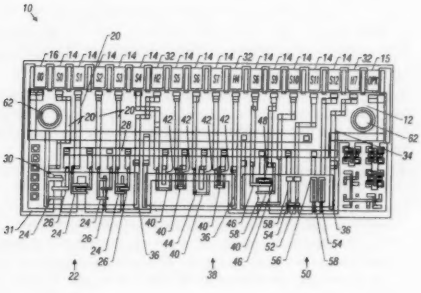
GAS SENSOR TEST CHIP SENSING METHOD

Martin Buehler, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of application No. 08/820,877, Mar. 21, 1997, Pat. No. 5,945,069, Provisional application No. 60/013,826, Mar. 21, 1996, Provisional application No. 60/014,772, Mar. 22, 1996. This application Aug. 10, 1999, Appl. No. 371,798.

Int. Cl.[7] **G01N** *27/12*

U.S. Cl. 436—151 **9 Claims**



1. A method of measuring characteristic responses of a gas sensor to a predetermined gas comprising:

(a) fabricating a gas sensor comprising a plurality of resistor elements, each having a plurality of electrodes with different geometric configurations, and depositing a polymer film over said electrodes;

(b) exposing said resistor elements to said predetermined gas; and

(c) measuring and storing patterns of characteristic changes in resistance of said resistor elements in response to said gas exposure.

6,040,190

METHOD FOR DETERMINING THE CONCENTRATION C OF AN ABSORBENT HOMOGENEOUSLY DISTRIBUTED IN A CARRIER

Gerd Schweiger, Graz, Austria, assignor to AVL Medical Instruments AG, Schaffhausen, Switzerland

Continuation of application No. 08/458,844, Jun. 2, 1995, abandoned. This application Apr. 14, 1997, Appl. No. 843,294.

Int. Cl.[7] **G01N** *21/00*

U.S. Cl. 436—164 **15 Claims**

1. A method of spectroscopically determining the concentration c of a sample of a nonlinear absorbent that does not conform to Lambert-Beer's law and so exhibits a non-linear relationship between concentration and absorption, the method comprising:

(a) forming a mathematical model of said nonlinear absorbent, said model including a plurality n, $n \geqq 2$, of model components each of which conforms to Lambert-Beer's law, the step of forming the mathematical model comprising:

(i) taking calibration spectroscopic data of absorption $a(\lambda)$ at the plurality n of wavelengths λ for each of a plurality of calibration samples of said non-linear absorbent, said calibration samples having known concentrations; and

(ii) from the calibration spectroscopic data taken in step (a)(i), determining parameters of the plurality of model components that would allow the plurality of model components to model the non-linear absorbency behavior of said absorbent by satisfying the following equation:

$$a(\lambda)=(\epsilon_1(\lambda)\cdot c_1+\epsilon_2(\lambda)\cdot c_2+\cdots\epsilon_n(\lambda)\cdot c_n)\cdot d$$

where each model component $\epsilon_i(\lambda)\cdot c_i$, $1 \leqq i \leqq n$, has a spectral absorption value given by $\epsilon_i(\lambda)$ and a concentration c_i; and

(b) applying the mathematical model to the sample of the absorbent, the step of applying the mathematical model comprising:

(i) taking measurement spectroscopic data for a sample of said absorbent of unknown concentration at the plurality n of wavelengths;

(ii) applying the equation set forth in (a)(ii) to said measurement spectroscopic data to determine the concentration values c_i of the plurality of model components corresponding to the measurement spectroscopic data; and

(iii) from the concentration values c_i of the plurality of model components, calculating C.

6,040,191

RAMAN SPECTROSCOPIC METHOD FOR DETERMINING THE LIGAND BINDING CAPACITY OF BIOLOGICALS

Ann E. Grow, 5882 Highplace Dr., San Diego, Calif. 92120

Division of application No. 08/864,015, May 27, 1997, Pat. No. 5,866,430, Provisional application No. 60/019,742, Jun. 13, 1996. This application Oct. 22, 1998, Appl. No. 177,548.

Int. Cl.[7] **G01N** *21/65*

U.S. Cl. 436—172 **11 Claims**

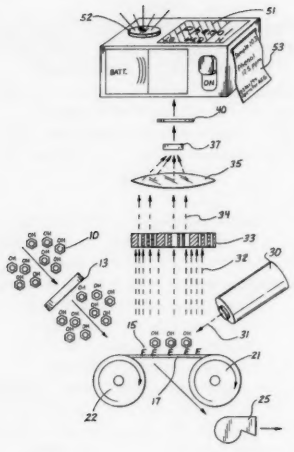
1. A nondestructive process for determining the capability of a test biological to bond with at least one ligand comprising the steps of

irradiating a test biological with a light source capable of producing Raman scattering to produce a Raman scattering spectrum of the irradiated test biological,

collecting and processing the Raman scattering spectrum, and

analyzing the processed Raman scattering spectrum to determine the capability of the test biological to react with ligands,

whereby said analyzing step includes the step of comparing the Raman scattering spectrum of the test biological so obtained for the test biological against the Raman scattering spectrum



correspondingly obtained from at least one standard sample of the same type of biological, said standard biological sample having a known ability to bind ligands.

6,040,192

METHOD AND MEANS FOR MAGNETIC PARTICLE SPECIFIC BINDING ASSAY

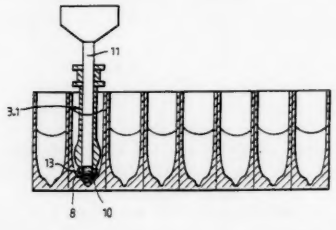
Jukka Tuunanen, Helsinki, Finland, assignor to Labsystems Oy, Helsinki, Finland

Continuation of application No. 08/495,514, filed as application No. PCT/FI94/00048, Feb. 1, 1994, abandoned. This application Aug. 26, 1997, Appl. No. 920,094.

Claims priority, application Finland, Feb. 1, 1993, 930440; Jun. 21, 1993, 932866

Int. Cl.[7] **G01N** *33/553*

U.S. Cl. 436—177 **21 Claims**



1. A method for determining the presence of an analyte in a sample, the method comprising the steps of:

a. inserting a sample to be tested into a reaction vessel;

b. inserting solid magnetic particles coated with separating reagent into said reaction vessel to react with the sample;

c. removing said particles from said reaction vessel by inserting a magnet-equipped remover into said reacting vessel, wherein said particles adhere to said remover;

d. inserting the remover containing the particles into a measuring vessel wherein at least one of said reaction and measuring vessels contains a medium and agitating the medium by moving said remover vertically while said particles adhere to said remover to improve adherence of said particles;

e. measuring the reaction between the separating reagent and the sample; and

f. determining the presence of the analyte.

6,040,193

COMBINATORIAL STRATEGIES FOR POLYMER SYNTHESIS

James L. Winkler; Stephen P. A. Fodor, both of Palo Alto, Calif.; Christopher J. Buchko, Ann Arbor, Mich.; Debra A. Ross, Fremont, Calif.; Lois Aldwin, San Mateo, Calif., and Douglas N. Modlin, Palo Alto, Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Continuation of application No. 08/426,202, Apr. 21, 1995, which is a continuation of application No. 07/980,523, Nov. 20, 1992, Pat. No. 5,677,195, which is a continuation-in-part of application No. 07/796,243, Nov. 22, 1991, Pat. No. 5,384,261, and a continuation-in-part of application No. 07/874,849, Apr. 24, 1992, Pat. No. 5,412,087. This application Aug. 4, 1998, Appl. No. 129,463.

Int. Cl.[7] **B01L** *3/02*

U.S. Cl. 436—180 **14 Claims**

1. A method of forming an array of polymers on a solid support, comprising:

(a) moving a dispenser containing a solution of a polymer toward a surface of a solid support until a tip of the dispenser touches the surface, moving the dispenser away from the surface and releasing a droplet of 5 nl or less from the dispenser, the droplet contacting the surface at a localized area smaller than 1 mm^2, whereby the polymer attaches to the surface of the support at the localized area;

(b) repeating (a) to attach a different polymer at a different localized area until an array of at least 100 different polymers at different localized areas is formed.

6,040,194

METHODS AND DEVICE FOR DETECTING AND QUANTIFYING SUBSTANCES IN BODY FLUIDS

William L. Chick, Wellesley; David E. Wolf, Hudson, both of Mass., and Richard A. Cardullo, Riverside, Calif., assignors to Sensor Technologies, Inc., Shrewsbury, Mass.

Continuation of application No. 08/302,396, Sep. 8, 1994, abandoned, which is a continuation of application No. 08/160,444, Dec. 1, 1993, abandoned, which is a continuation of application No. 07/905,729, Jun. 29, 1992, abandoned, which is a continuation-in-part of application No. 07/452,122, Dec. 14, 1989, Pat. No. 5,342,789. This application Jun. 6, 1995, Appl. No. 467,915.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61B** *5/00;8/00;* **G01N** *21/64;* **A61K** *49/00*

U.S. Cl. 436—501 **30 Claims**

1. An in vivo method for determining an analyte in the body fluids of an individual comprising the steps of

a) placing a sensor in communication with the body fluids of said individual suspected of containing said analyte in such a way that once in place said sensor does not exit the skin of the individual,

said sensor comprising a fluorescence reagent for detecting said analyte that reversibly binds to said analyte,

said fluorescence reagent having a fluorescence intensity, an emission spectrum, an excitation spectrum, or an excited state lifetime in the presence of said analyte that is different from its fluorescence intensity, emission spectrum, excitation spectrum, or excited state lifetime in the absence of said analyte,

said sensor being configured to retain said fluorescence reagent while allowing said analyte to diffuse into and out of said sensor;

b) transdermally illuminating said sensor; and

c) measuring the fluorescence intensity, emission spectrum, excitation spectrum, or excited state lifetime of said fluorescence reagent relative to the fluorescence intensity, emission spectrum, excitation spectrum, or excited state lifetime of said fluorescence reagent in the absence of said analyte; and

d) correlating the change in fluorescence intensity, emission spectrum, excitation spectrum, or excited state lifetime of said fluorescence reagent with the presence or amount of said analyte in said individual.

6,040,195

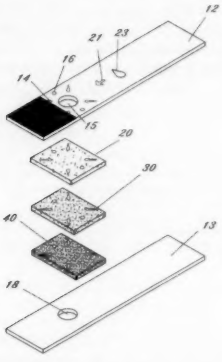
DIAGNOSTIC SANITARY TEST STRIP

Patrick Carroll, Ft. Lauderdale; Jon Schneider, Weston, both of Fla., and Douglas E. Bell, Woodstock, Ga., assignors to Home Diagnostics, Inc., Ft. Lauderdale, Fla.

Filed Jun. 10, 1997, Appl. No. 872,088

Int. Cl.[7] G01N *33/558*

U.S. Cl. 436—514 **23 Claims**



1. A diagnostic sanitary test strip device for measuring an analyte of interest in a heterogenous fluid sample, said test strip comprising:

(a) an upper support layer defining a sample receiving port for receiving the fluid sample therein;

(b) means for retaining the fluid sample to prevent spillage of the sample from said strip to make said test strip sanitary, wherein said retaining means comprises a plurality of dam partitions penetrating said test strip, said dam partitions being defined by indentations formed in said upper layer;

(c) means, in vertical alignment and contiguous contact with said sample receiving port, for uniformly spreading the fluid sample in said receiving port before allowing said fluid sample to vertically pass through said spreading means;

(d) means, in contiguous contact with said spreading means, for filtering the fluid sample received from said spreading means to remove at least one undesirable element in the fluid sample prior to passing the fluid sample through said filtering means;

(e) a reaction membrane, in contiguous contact with said filtering means, having a predetermined porosity, said membrane retaining a reagent solution capable of reacting with the analyte of interest to produce a color change in said membrane corresponding to the amount of analyte present in the fluid sample; and

(f) a lower support layer in contiguous contact with said membrane and having a reaction viewing port in vertical alignment with said membrane for displaying said color change, wherein said retaining means, said spreading means, said filtering means, and said reaction membrane interpose said lower support and said upper support to secure said test strip.

6,040,196

METHOD OF EVALUATING A TESTING ELEMENT FOR ANTIGENS OR ANTIBODIES

Ayumi Mitoh, and Tsuneo Hiraide, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1996, Appl. No. 754,647

Claims priority, application Japan, Nov. 21, 1995, 7-302697

Int. Cl.[7] G01N *33/543;21/00;33/53;* **A61L** *5/103*

U.S. Cl. 436—518 **20 Claims**

1. A method of evaluating an amount of antigen or antibody immobilized on a solid phase carrier comprising a calcium phosphate compound, of a test element, the method comprising:

(a) contacting the test element with a known amount of a first antibody or antigen which specifically binds to the immobilized antigen or antibody, respectively, to form a first immunocomplex;

(b) contacting the first immunocomplex with an enzyme-labelled antigen or antibody which specifically binds to the first antibody or antigen to form a labelled immunocomplex;

(c) contacting the labelled immunocomplex with a substrate which reacts with the enzyme of the enzyme-labelled antigen or antibody to produce a color; and

(d) comparing the amount of the color produced on the test element to a standard color produced by a reference test element with a known amount of the immobilized antigen or antibody thereon processed according to (a)–(c) to determine the amount of the antigen or antibody immobilized on the solid phase carrier of the test element.

6,040,197

METHOD FOR THE PREPARATION OF FREE RADICAL PHARMACEUTICALS, DIAGNOSTICS AND DEVICES USING SELENIUM CONJUGATES

Julian E. Spallholz, 6105 Elmwood Ave., Lubbock, Tex. 79424, and Ted W. Reid, 3511 43rd St., Lubbock, Tex. 79413

Division of application No. 08/432,584, May 9, 1995, Pat. No. 5,783,454, which is a continuation-in-part of application No. 08/243,704, May 17, 1994, abandoned. This application Jan. 22, 1998, Appl. No. 12,149.

Int. Cl.[7] G01N *33/553*

U.S. Cl. 436—525 **4 Claims**

1. An implant comprising:

a device made of an insoluble material structured for implantation at a predetermined target site, and having reactive constituents on a surface thereof;

at least a portion of said surface of said device being coated with an organic selenium compound selected from the group consisting of RSeH, RSeR, RSeR', RSeSeR and RSeSeR', wherein R and R' are the same or different and each is an aliphatic residue containing at least one reactive group selected from the group consisting of aldehyde, amino, alcoholic, phosphate, sulfate, halogen, phenolic reactive groups and combinations thereof, for complementary attachment to at least one of said reactive constituents of said material.

6,040,198

ELEMENT CONCENTRATION MEASURING METHOD AND APPARATUS, AND SEMICONDUCTOR DEVICE FABRICATION METHOD AND APPARATUS

Satoshi Komiya; Naoki Awaji, and Shunji Kashiwagi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of application No. 08/757,622, Nov. 27, 1996, Pat. No. 5,740,226. This application Feb. 4, 1998, Appl. No. 18,852.

Claims priority, application Japan, Nov. 30, 1995, 7-312441; Jun. 9, 1997, 9-151226

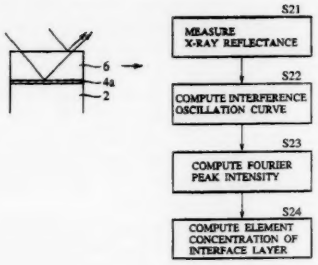
Int. Cl.[7] G01R *31/26*

U.S. Cl. 438—16 **7 Claims**

1. An element concentration measuring method comprising:

irradiating X-rays to a sample to be measured including at least one film formed on a substrate;

measuring an interference oscillation curve of the X-rays reflected on the sample to be measured; and



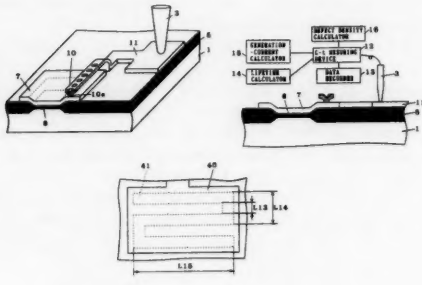
measuring a concentration of an element adhered on a surface of the sample to be measured and/or segregated in an interface of the film based on the interference oscillation curve.

6,040,199

SEMICONDUCTOR TEST STRUCTURE FOR ESTIMATING DEFECTS AT ISOLATION EDGE AND TEST METHOD USING THE SAME

Mikihiro Kimura, and Masahiro Sekine, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1997, Appl. No. 835,488
Claims priority, application Japan, Nov. 22, 1996, 8-311780
Int. Cl.[7] G01R *31/26;* **H01L** *21/66*
U.S. Cl. 438—17 **4 Claims**



1. A semiconductor test structure for estimating defects at an isolation edge, comprising:

a first insulation film provided on a main surface of a semiconductor substrate in which a plurality of semiconductor elements can be provided, said first insulation film having a width so as to isolate said plurality of semiconductor elements from one another;

a second insulation film provided on said main surface, said second insulation film including a plurality of regions spaced from one another and being contiguous with said first insulation film, thinner than said first insulation film, and having an edge which comprises at least a part of the isolation edge;

an electrode disposed in common on said plurality of regions of said second insulation film, said electrode extending onto portions of said first insulation film; and

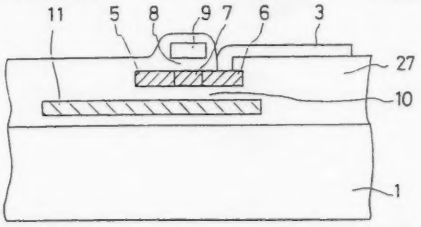
electrical connecting means connected with the semiconductor substrate so as to permit a voltage to be applied between the semiconductor substrate and the electrode.

6,040,200

METHOD OF FABRICATING SEMICONDUCTOR DEVICE HAVING STACKED-LAYERED SUBSTRATE

Yutaka Hayashi, Tsukuba; Masaaki Kamiya, Tokyo; Yoshikazu Kojima, Tokyo, and Hiroaki Takasu, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, and Seiko Instruments Inc., both of Japan

Continuation of application No. 08/060,163, May 7, 1993, Pat. No. 5,672,518, which is a division of application No. 07/771,756, Oct. 4, 1991, Pat. No. 5,233,211. This application Apr. 14, 1997, Appl. No. 834,168.
Claims priority, application Japan, Oct. 16, 1990, 2-277436
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H01L *21/84*
U.S. Cl. 438—30 **19 Claims**



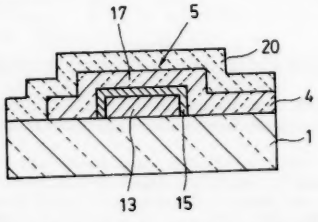
1. A method of fabricating a light valve device, comprising the steps of: forming a substrate having stacked layers including a light-shielding thin film layer and an insulating film stacked in this order on a transparent support substrate; adhering a semiconductor single crystal material to the insulating film; polishing the semiconductor single crystal material to form a single crystalline semiconductor thin film on the insulating film; forming a light-shielding layer pattern by selectively etching the stacked layers; then forming a switching element comprised of a transistor having a channel region formed in the single crystalline semiconductor thin film and a main gate electrode covering the channel region, wherein the channel region is provided over the light-shielding pattern layer to prevent light incident from the transparent support substrate from illuminating the channel region to suppress a photo-induced leakage current in the channel region; forming a transparent electrode electrically connected to the switching element; providing an opposing substrate over the substrate at the side of the single crystalline semiconductor thin film; and interposing an electro-optical material layer between the substrate and the opposing substrate.

6,040,201

METHOD OF MANUFACTURING THIN FILM DIODE

Yuichi Akiba, and Masafumi Ide, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1997, Appl. No. 931,972
Claims priority, application Japan, Sep. 17, 1996, 8-244767
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H01L *21/00*
U.S. Cl. 438—30 **14 Claims**



1. A method of manufacturing a thin film diode provided in a liquid crystal display, comprising a lower electrode connected with a signal electrode, an anodic oxidation film formed on a surface of

the lower electrode, and an upper electrode formed so as to overlie the lower electrode via the anodic oxidation film and connected with a pixel electrode, said method comprising:

a process comprising steps of forming a lower electrode material film of tantalum nitride on a substrate, forming a photoresist on the lower electrode material film, and patterning on the photoresist by applying a photolithographic treatment;

a process of forming the lower electrode and the signal electrode by etching the lower electrode material film using the patterned photoresist as an etching mask;

a process of forming an anodic oxidation film of a tantalum oxide film on the surface of the lower electrode by applying an anodic oxidation treatment to the lower electrode using an anodic oxidation solution;

a first annealing process applied annealing in a vacuum to the anodic oxidation film;

a process of forming an upper electrode material film composed of a transparent and electrically conductive film on an entire surface of the substrate including the surface of the lower electrode with the anodic oxidation film formed thereon;

a second annealing process applied annealing in a vacuum to the substrate with the upper electrode material film formed thereon;

a process comprising steps of forming a photoresist on the upper electrode material film, and patterning on the photoresist by applying the photolithographic treatment; and

a process of forming the upper electrode and the pixel electrode by etching the upper electrode material film using the patterned photoresist as an etching mask.

6,040,202

COLOR LINEAR CHARGE COUPLED DEVICE AND METHOD FOR DRIVING THE SAME

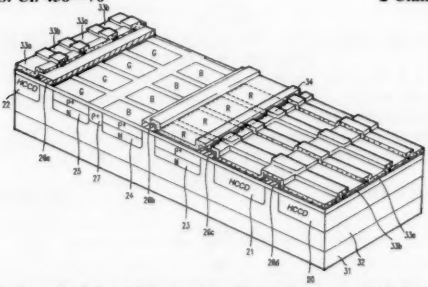
Young J. Yu, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Division of application No. 08/670,099, Jun. 25, 1996, Pat. No. 5,751,032. This application Aug. 18, 1997, Appl. No. 912,650.

Claims priority, application DPR of Korea, Dec. 11, 1995, 48245

Int. Cl.[7] H01L *21/339*

U.S. Cl. 438—70 **2 Claims**



1. A method for driving a color linear charge coupled device having a photo diode array portion having a red detecting photo diode array formed in a predetermined area of said second conductivity type well region, a blue detecting photo diode array, and a green detecting photo diode array, the blue and green photo diode arrays separately formed on a first side of said red detecting photo diode array, the photo diode arrays for generating signal charges by a photoelectric conversion; a horizontal charge coupled device (HCCD) shift register portion having first and second HCCD shift registers each separately formed on a second side, opposite the first side, of said red detecting photo diode array and a third HCCD shift register formed on the first side of the red detecting photo diode array; a first transfer gate for moving signal charge; a second transfer gate for moving signal charge; a third transfer gate for moving signal charge; and a fourth transfer gate array for moving signal charge from said red detecting photo diode array, said method comprising the steps of:

moving the signal charges generated at said red detecting photo diode array toward said first HCCD shift register via said second HCCD shift register, and moving the signal charges generated at said green detecting photo diode array toward said third HCCD shift register by driving said first, third and fourth transfer gates; and

turning off said fourth transfer gate, turning on said second transfer gate and moving the signal charges generated at said blue detecting photo diode array toward said second HCCD shift register via said red detecting photo diode array.

6,040,203

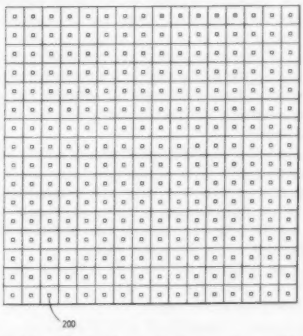
CLOCK SKEW MINIMIZATION AND METHOD FOR INTEGRATED CIRCUITS

Ferenc Miklos Bozso, Peekskill, N.Y., and Philip George Emma, Danbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/700,261, Aug. 20, 1996, Pat. No. 5,760,478. This application Oct. 20, 1997, Appl. No. 954,709.

Int. Cl.[7] H01L *21/44;21/48;21/50;21/30;21/46*

U.S. Cl. 438—106 **13 Claims**



1. A method for distributing a clock signal to multiple receiving points on a chip in which the skew of said clock signal as received at said receiving points is minimized, said method comprising the steps of:

placing I/O pads for said receiving points on a regular grid across the surface of a primary chip,

constructing a clock-distribution network on a secondary chip wherein the outputs of said network are I/O pads that are placed on a regular grid across the surface of said secondary chip, said grid on secondary chip being a mirror-image of the grid on the primary chip,

bonding said primary chip to said secondary chip surface-to-surface.

6,040,204

METHOD OF STACKING CHIPS WITH A REMOVABLE CONNECTING LAYER

Werner Herden, Gerlingen; Johann Konrad, Tamm; Hans-Peter Jahn, Pliezhausen; Martin Knapp, Kirchentellinsfurt; Hans-Peter Fuessl, and Ning Qu, both of Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

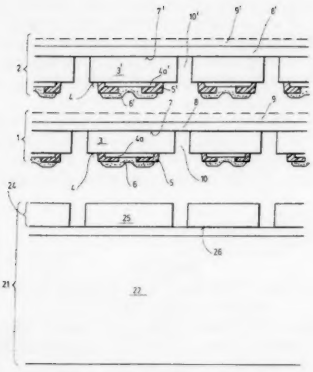
Filed Aug. 28, 1998, Appl. No. 143,309

Claims priority, application Germany, Sep. 10, 1997, 197 39 684

Int. Cl.[7] H01L *23/10*

U.S. Cl. 438—109 **30 Claims**

1. A method for manufacturing a first number of chip stacks by stacking a second number of wafers, each of the wafers having a third number of chips, on top of one another, comprising the steps of:



(a) applying adhesive material to one side of a first wafer of the second number of wafers;
(b) applying adhesive foil to another side of the first wafer;
(c) separating the third number of chips of the first wafer, whereby the third number of chips are still connected by the adhesive foil;
(d) providing a base arrangement for positioning the adhesive material side of the first wafer on the base arrangement;
(e) removing the adhesive foil from the adhesive foil side of the first wafer, whereby the first wafer is adapted to become a mounting wafer;
(f) applying adhesive material to one side of a next wafer of the second number of wafers;
(g) applying adhesive foil to another side of the next wafer;
(h) separating the third number of chips of the next wafer;
(i) positioning the adhesive material side of the next wafer on the another side of the mounting wafer;
(j) removing the adhesive foil from the adhesive foil side of the next wafer, whereby the next wafer is adapted to become another mounting wafer; and
(k) repeating steps (f) through (j) until all of the second number of wafers, each having the third number of separate chips, have been stacked to form the first number of separate chip stacks.

6,040,205

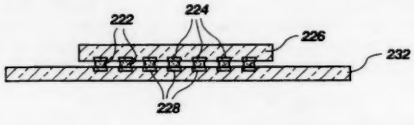
APPARATUS AND METHOD FOR CONTROLLING THE DEPTH OF IMMERSION OF A SEMICONDUCTOR ELEMENT IN AN EXPOSED SURFACE OF A VISCOUS FLUID

Syed Sajid Ahmad, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation-in-part of application No. 08/906,578, Aug. 5, 1997, which is a continuation-in-part of application No. 08/906,673, Aug. 5, 1997. This application Feb. 6, 1998, Appl. No. 20,197.

Int. Cl.[7] H01L *21/44;21/48;21/50*

U.S. Cl. 438—118 **30 Claims**



1. A method of applying a viscous material to a semiconductor element, comprising:

providing a reservoir having said viscous material disposed therein, wherein said viscous material extends upwardly from said reservoir at a desired height thereabove to form an exposed surface of said viscous material above said reservoir;

providing a stop adjacent said reservoir; and

contacting a portion of a bottom surface of said semiconductor element with said exposed surface of said viscous material to deposit a portion of said viscous material on said semiconductor element bottom surface portion, wherein said semiconductor element contacts said stop which limits a depth of immersion of said semiconductor element into said viscous material.

6,040,206

THIN FILM TRANSISTOR

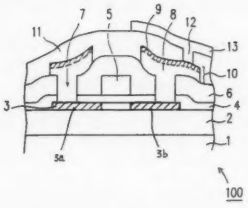
Saori Kurogane, Higashiosaka, and Hiromi Sakamoto, Kashiba, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of application No. 08/757,765, Nov. 27, 1996, Pat. No. 5,831,281. This application Sep. 3, 1998, Appl. No. 146,428.

Claims priority, application Japan, Nov. 28, 1995, 7-309614

Int. Cl.[7] H01L *21/339*

U.S. Cl. 438—149 **19 Claims**



4. A method for fabricating a thin film transistor, comprising the step of forming a double-layered conductive layer of an Al-containing metal film and an N-containing Mo film, the conductive layer being connected to source and drain regions formed on an insulating base region,

wherein the N-containing Mo film is formed by introducing nitrogen into a film formed by a Mo deposition.

6,040,207

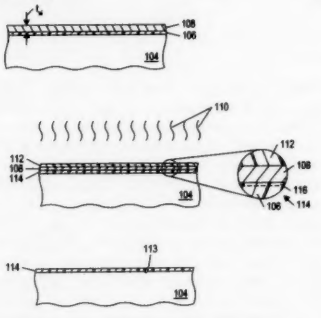
OXIDE FORMATION TECHNIQUE USING THIN FILM SILICON DEPOSITION

Mark I. Gardner, Cedar Creek, and Mark C. Gilmer, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of application No. 08/812,740, Mar. 6, 1997. This application Nov. 10, 1998, Appl. No. 189,278.

Int. Cl.[7] H01L *21/316*

U.S. Cl. 438—216 **11 Claims**



1. A method of forming a transistor comprising:

providing a semiconductor substrate, wherein an upper region of said semiconductor substrate comprises a native oxide film;

depositing a silicon film on said native oxide film;

forming a first oxide film on said native oxide film by thermally oxidizing a portion of said silicon film proximal to said native oxide film, while leaving an unoxidized portion of said silicon film superjacent to said oxidized portion to form a gate dielectric;

forming a conductive gate on the gate dielectric; and

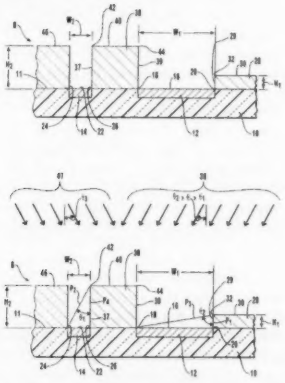
forming a pair of source/drain structures within a pair of source/drain regions of said semiconductor substrate, wherein said pair of source/drain structures are laterally displaced on either side of a channel region of said semiconductor substrate.

6,040,208

ANGLED ION IMPLANTATION FOR SELECTIVE DOPING

Jeffrey W. Honeycutt; Fernando Gonzalez, and Fawad Ahmed, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 29, 1997, Appl. No. 920,535
Int. Cl.[7] H01L *21/8238*
U.S. Cl. 438—229 **33 Claims**



1. A method of implanting a semiconductor substrate comprising:

forming a first active region in an N-doped well within a semiconductor substrate that is oriented in a major plane, the first active region extending at a top surface of the semiconductor substrate from a first side to a second side separated by a first length;

forming a first barrier wall extending from the first side of the first active region to a top surface;

forming a second barrier wall extending from the second side of the first active region to a top surface;

forming a second active region in a P-doped well within the semiconductor substrate, the second active region extending at the top surface of the semiconductor substrate from a first side to a second side separated by a second length parallel to and less than the first length;

forming a third barrier wall extending from the first side of the second active region to a top surface, the first, second, and third barrier walls each projecting above the semiconductor substrate, wherein:

the shortest line taken from the top surface of the third barrier wall to the second side of the second active region makes a first angle with respect to an axis perpendicular to the major plane of the semiconductor substrate; and

the shortest line taken from the top surface of the first barrier wall to the second side of the first active region makes a second angle with respect to the axis perpendicular to the major plane of the semiconductor substrate;

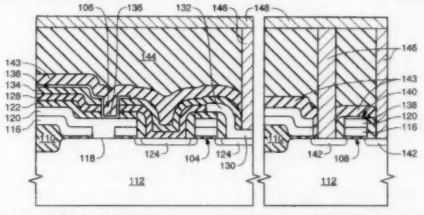
bombarding the semiconductor substrate with doping ions at a third angle with respect to the axis perpendicular to the major plane of the semiconductor substrate that is less than the second angle and greater than the first angle.

6,040,209

SEMICONDUCTOR MEMORY DEVICE AND METHOD OF FORMING TRANSISTORS IN A PERIPHERAL CIRCUIT OF THE SEMICONDUCTOR MEMORY DEVICE

Ceredig Roberts, Boise, Id., assignor to Micron Technology, Boise, Md.

Continuation of application No. 08/376,103, Jan. 19, 1995, abandoned. This application Jan. 21, 1997, Appl. No. 786,175.
Int. Cl.[7] H01L *21/8244*
U.S. Cl. 438—238 **3 Claims**



1. A method of forming a transistor in a peripheral circuit of a static random access memory device (SRAM), comprising the steps of:

forming a first polysilicon layer over a substrate in a memory cell array region and in a peripheral region of the SRAM;

removing a portion of the first polysilicon layer in the array region to at least partially define a memory transistor gate;

forming a second polysilicon layer over the first polysilicon layer; and

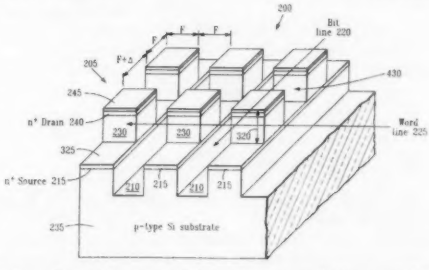
simultaneously removing a portion of the second polysilicon layer in the peripheral region and in the memory cell array region to at least partially define a periphery transistor gate in the peripheral region and a load resistor in the memory cell array region.

6,040,210

2F-SQUARE MEMORY CELL FOR GIGABIT MEMORY APPLICATIONS

Stuart Mcallister Burns, Jr., Ridgefield, Conn., and Hussein Ibrahim Hanafi, Goldens Bridge, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/787,418, Jan. 22, 1997. This application Jan. 26, 1998, Appl. No. 13,509.
Int. Cl.[7] H01L *21/8249;29/788*
U.S. Cl. 438—238 **11 Claims**



1. A method of forming a 2F-square memory device comprising the steps of:

forming on a substrate an array of pillars arranged in rows and columns;

forming lower doped regions extending inwardly from each sidewall of said pillar, said lower doped regions being separated from each other;

forming first and second gate regions on pillar sidewalls, said first and second gate regions being opposite each other along said columns; and

forming upper doped regions on said pillars.

6,040,211

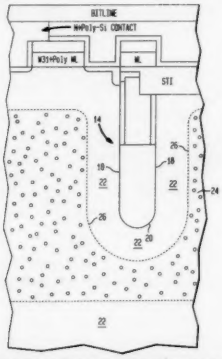
SEMICONDUCTORS HAVING DEFECT DENUDED ZONES

Martin Schrems, Langebrueck, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 9, 1998, Appl. No. 93,796

Int. Cl.[7] H01L *21/8234*

U.S. Cl. 438—238 **21 Claims**



1. A method for processing a semiconductor substrate having an oxygen concentration in a region of the substrate adjacent to a surface of such substrate, comprising:

forming a trench in the surface of the substrate; and

subsequent to the formation of the trench, reducing the oxygen concentration within the region.

6,040,212

METHODS OF FORMING TRENCH-GATE SEMICONDUCTOR DEVICES USING SIDEWALL IMPLANTATION TECHNIQUES TO CONTROL THRESHOLD VOLTAGE

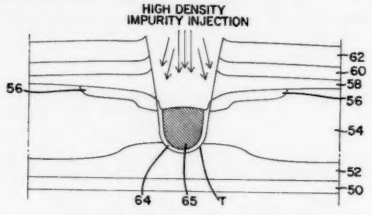
Hyun-Chul Kim, Kyungki-do, Rep. of Korea, assignor to Fairchild Korea Semiconductor, Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 4, 1997, Appl. No. 833,403

Claims priority, application Rep. of Korea, Aug. 16, 1996, 96-33956

Int. Cl.[7] H01L *21/8242*

U.S. Cl. 438—242 **11 Claims**



1. A method of forming a semiconductor switching device, comprising the steps of:

forming a semiconductor substrate containing a trench therein at a first face thereof, a body region of second conductivity type extending adjacent a sidewall of the trench, and a source region of first conductivity type in the body region and extending adjacent the sidewall of the trench and the first face;

forming an electrically insulating region on the sidewall of the trench;

forming an electrically conductive region in the trench; and

implanting dopants of first conductivity type through the electrically insulating region and sidewall of the trench and into the source region of first conductivity type to increase a first conductivity type doping concentration therein.

6,040,213

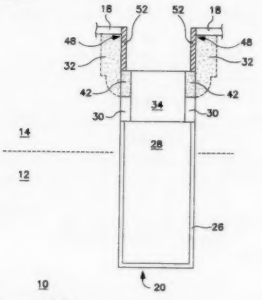
POLYSILICON MINI SPACER FOR TRENCH BURIED STRAP FORMATION

Anthony J. Canale, Essex Junction, and John E. Cronin, Milton, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 20, 1998, Appl. No. 8,873

Int. Cl.[7] H01L *21/8242*

U.S. Cl. 438—243 **11 Claims**



1. A method comprising:

(a) providing a substrate comprising a trench having a conductor separated from walls of the trench by a dielectric material;

(b) removing a portion of the dielectric material to a level below a top surface of the conductor;

(c) filling at least a portion of a space formed by the removing of the dielectric material with a diffusible material; and

(d) forming a conductive pathway from a wall of the trench to the conductor including annealing the conductor, the wall and the diffusible material so that conductive elements from the wall and the conductor diffuse into the diffusible material.

6,040,214

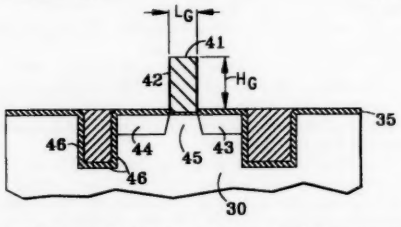
METHOD FOR MAKING FIELD EFFECT TRANSISTORS HAVING SUB-LITHOGRAPHIC GATES WITH VERTICAL SIDE WALLS

Diane C. Boyd, Lagrangeville, N.Y.; Stuart M. Burns, Brookfield, Conn.; Hussein I. Hanafi, Goldens Bridge, N.Y.; Yuan Taur, Bedford, N.Y., and William C. Wille, Red Hood, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1998, Appl. No. 26,261

Int. Cl.[7] H01L *21/8242;21/20*

U.S. Cl. 438—244 **29 Claims**



1. Method for the formation of a metal oxide semiconductor field effect transistor (MOSFET), comprising the steps:

forming a dielectric stack on a semiconductor structure;

defining an etch window on said dielectric stack;

defining a gate hole in the dielectric stack by transferring the etch window into the dielectric stack using a reactive ion etching (RIE) process;

depositing a side wall layer;

removing the side wall layer from horizontal surfaces such that side wall spacers remain inside the gate hole thus reducing the lateral size of the gate hole;

depositing a gate conductor such that it fills the gate hole;

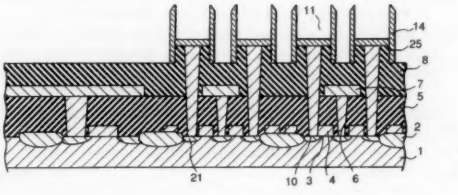
removing the gate conductor outside the gate hole;
removing at least part of the dielectric stack; and
removing the side wall spacers.

6,040,215

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE INCLUDING MEMORY CELL HAVING TRANSISTOR

Yoshihiro Takaishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 6, 1997, Appl. No. 870,861
Claims priority, application Japan, Jun. 7, 1996, 8-145995
Int. Cl.[7] H01L *21/8242*
U.S. Cl. 438—253 **16 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:
forming a first insulating film on a semiconductor substrate,
forming a contact hole in said first insulating film,
forming a first conductive film in said contact hole and on said first insulating film to bury said contact hole,
forming a second insulating film on said first conductive film,
selectively etching said second insulating film, said first conductive film, and a part of said first insulating film to produce a patterned second insulating film, a patterned first conductive film, and a patterned first insulating film respectively, said first insulating film being removed to a depth below said first conductive film,
forming sidewalls made of a conductive material on sides of said patterned first and second insulating films and said patterned first conductive film to connect said sidewalls with said patterned first conductive film so that the ratio of the height of the part of said sidewalls connected with said side of said patterned first insulating film to the height of the part of said sidewalls connected with said side of said patterned second insulating film is not less than 0.5,
removing said patterned second insulating film after said sidewalls are formed,
forming a dielectric film on the surface of said patterned first conductive film and said sidewalls while keeping said sidewalls in contact with said sides of said patterned first insulating films, and
forming a second conductive film to cover said dielectric film.

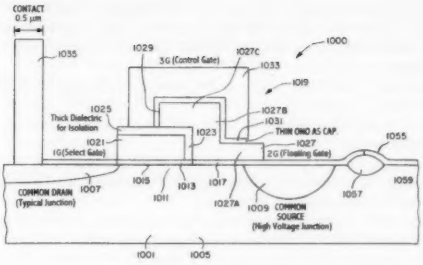
6,040,216

METHOD (AND DEVICE) FOR PRODUCING TUNNEL SILICON OXYNITRIDE LAYER

Kuo-Tung Sung, Hsinchu, Taiwan, assignor to Mosel Vitelic, Inc., Hsinchu, Taiwan

Filed Feb. 5, 1998, Appl. No. 19,431
Claims priority, application Taiwan, Aug. 11, 1997, 86111486
Int. Cl.[7] H01L *21/336*
U.S. Cl. 438—257 **17 Claims**

1. A method of fabricating a flash memory device, said method comprising steps of:
providing a semiconductor substrate comprising a first active region, a second active region, and an isolation region, said isolation region being defined between said first active region and said second active region;



masking a portion of said isolation region and said second active region;
introducing a nitrogen beating impurity into a surface of said first active region, said mask substantially protecting said second active region from said nitrogen bearing impurities;
removing said portion being masked; and
forming a silicon oxynitride layer from said nitrogen bearing impurity on said surface of said first active region and forming silicon dioxide on said second active region.

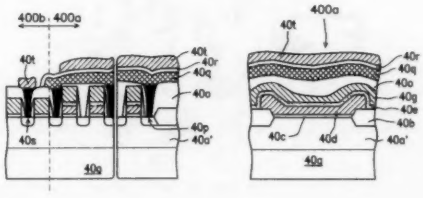
10. A method of fabricating an integrated circuit, said method comprising steps of:
providing a semiconductor substrate comprising a first active region, a second active region, and an isolation region, said isolation region being defined between said first active region and said second active region, said first active region corresponding to a flash memory cell, and said second region corresponding to a thin film MOS device;
masking a portion of said second active region and introducing a nitrogen bearing impurity into a surface of said first active region;
removing said portion being masked; and
forming a silicon oxynitride layer from said nitrogen bearing impurity on said surface of said first active region;
wherein said second active region is substantially free from any nitrogen bearing impurities to prevent a possibility of any Kooi influence on said second active region during a subsequent thermal treatment process.

6,040,217

FABRICATING METHOD OF AN ULTRA-FAST PSEUDO-DYNAMIC NONVOLATILE FLASH MEMORY

Ruei-Ling Lin, 5F-3, No. 26-12, Park II Rd., Kaohsiung-city, and Ching-Hsiang Hsu, No. 100-28, Chien-Chung Rd., Hsinchu-city, both of Taiwan

Filed Apr. 20, 1998, Appl. No. 63,033
Int. Cl.[7] H01L *21/8247*
U.S. Cl. 438—258 **30 Claims**



1. A fabricating method of an ultra-fast pseudo-dynamic nonvolatile flash memory, wherein a characteristic of the memory is to comprise a capacitor coupled to a local bit line, the method comprising:
providing a substrate with a P-well, dividing the substrate into a memory cell region and a peripheral region, forming a field oxide layer on the substrate for electrical isolation;

forming a first gate oxide layer and a first polysilicon layer on the memory cell region of the substrate in sequence, and implanting a first N-type dopant into the first polysilicon layer;

forming a dielectric layer on the memory cell region of the substrate;

forming a second gate oxide layer on the peripheral region of the substrate;

forming a second polysilicon layer over the substrate;

etching the second polysilicon layer on the peripheral region to form a gate layer;

etching the second polysilicon layer, the dielectric layer, and the first polysilicon layer on the memory cell region to form a stacked layer on the memory cell region;

removing a part of the field oxide layer by self-aligned-source etching, implanting a second N-type dopant into the memory cell region of the substrate by medium doped drain ion implantation to form a plurality of first doped regions;

implanting a third N-type dopant into the peripheral region of the substrate by lightly doped drain ion implantation to form a plurality of second doped regions;

forming an oxide spacer layer over the substrate, implanting a fourth N-type dopant to perform a source/drain ion implantation and form a plurality of first sources and a plurality of first drains on the memory cell regions of the substrate, and a second source on the peripheral region of the substrate, wherein a step of the self-aligned-source etching to remove the part of the field oxide layer is to connect the first sources;

forming a first oxide layer and a first opening therein to expose the first and the second drains;

forming a tungsten plug to fill the contact;

forming a third polysilicon layer which covers the memory cell region of the substrate;

forming a oxy-nitride layer to cover the third polysilicon layer entirely; and

covering a first metal layer over the substrate and patterning the first metal layer;

wherein, the first metal layer on the memory cell region, the oxy-nitride layer, and the third polysilicon layer form the capacitor, while the third polysilicon layer forms the local bit line.

6,040,218

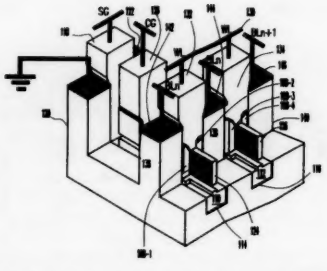
TWO SQUARE NVRAM CELL

Chung H. Lam, Williston, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 09/100,729, Jun. 19, 1998. This application Sep. 13, 1999, Appl. No. 394,093.

Int. Cl.[7] H01L *21/8247*

U.S. Cl. 438—259 **9 Claims**



1. A method of forming an array of non-volatile random access memory (NVRAM) cells comprising the steps of:

a) etching a plurality of trenches in a semiconductor layer;

b) forming a source gate line of a first conductive material in said trenches;

c) forming sidewalls of said first conductive material above said source gate line along the sidewalls of said trenches;

d) forming a plate of a second conductive material between said first conductive material sidewalls;

e) plugging said trenches above said plate with said first conductive material;

f) forming perpendicular to said trenches a plurality of second trenches, said second trenches dividing said trenches such that semiconductor pillars are formed, said first conductive material sidewalls are divided into floating gates adjacent said semiconductor pillars and said first conductive material plugging said trenches is divided into word line plugs adjacent said semiconductor pillars.

6,040,219

METHOD OF FABRICATING POWER SEMICONDUCTOR DEVICE USING SEMI-INSULATING POLYCRYSTALLINE SILICON (SIPOS) FILM

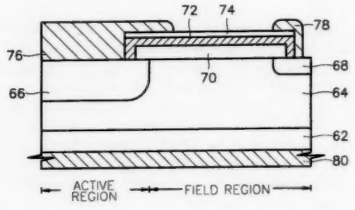
Chan-ho Park, Incheon, and Jae-hong Park, Bucheon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 9, 1998, Appl. No. 150,171

Claims priority, application Rep. of Korea, Sep. 9, 1997, 97-46397

Int. Cl.[7] H01L *21/336*

U.S. Cl. 438—268 **14 Claims**



1. A method for manufacturing a power semiconductor device, comprising the steps of:

(a) forming a conductive collector region in a semiconductor substrate;

(b) forming a first insulating film over collector region, the first insulating film exposing a first portion of the collector region;

(c) forming a conductive base region in the exposed first portion of the collector region;

(d) forming a second insulating film over the collector region, the second insulating film exposing a second portion of the collector region and a third portion of the base region;

(f) implanting first impurities for the emitter region into the third portion of the base region;

(g) implanting second impurities for the channel stop region into the second portion of the collector region;

(h) simultaneously forming a third insulating film over the collector region, forming a conductive emitter region by diffusing the first implanted impurities, and forming a channel stop region by diffusing the second implanted impurities;

(i) removing portions of the first, second, and third insulating films over the base, emitter, and channel stop regions to create a remaining insulating film in a field region between the base region and the channel stop region;

(j) forming a semi-insulating polycrystalline silicon (SIPOS) film over the semiconductor substrate and the remaining insulating layer, such that parts of the base region, the emitter region, and the channel stop region are exposed;

(k) forming a base electrode contacting the base region;

(l) forming an emitter electrode contacting the emitter region; and

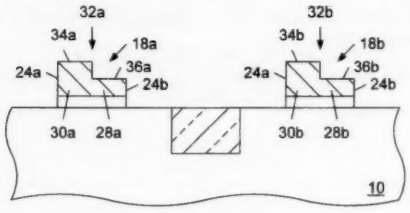
(m) forming an equipotential metal ring contacting the channel stop region.

6,040,220

ASYMMETRICAL TRANSISTOR FORMED FROM A GATE CONDUCTOR OF UNEQUAL THICKNESS

Mark I. Gardner, Cedar Creek; Daniel Kadosh, and Michael P. Duane, both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 14, 1997, Appl. No. 950,203
Int. Cl.[7] H01L *21/00*
U.S. Cl. 438—286 **12 Claims**



1. A method for forming a transistor, comprising:

forming a gate dielectric upon a semiconductor substrate;

patterning a gate conductor extending upon the gate dielectric along an axis, wherein the gate conductor comprises a pair of sidewall surfaces spaced an equal distance from and parallel to said axis;

removing an upper portion of the gate conductor laterally bounded by said axis and one of said pair of sidewall surfaces to form a partially retained area of the gate conductor extending along the axis adjacent a fully retained area of the gate conductor, wherein a thickness of the gate conductor adjacent to the one of said pair of sidewall surfaces is less than a thickness of the gate conductor adjacent to the other of said pair of sidewall surfaces; and

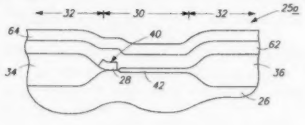
forwarding a plurality of ionized atoms toward the gate conductor at an energy level which allows a portion of said plurality of atoms to extend through the partially retained areas of the gate conductor and form a lightly doped drain (LDD) region within the substrate directly beneath the partially retained area.

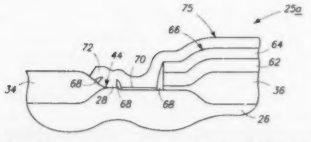
6,040,221

SEMICONDUCTOR PROCESSING METHODS OF FORMING A BURIED CONTACT, A CONDUCTIVE LINE, AN ELECTRICAL CONNECTION TO A BURIED CONTACT AREA, AND A FIELD EFFECT TRANSISTOR GATE

Monte Manning, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of application No. 08/562,928, Nov. 27, 1995, Pat. No. 5,681,778. This application Jun. 16, 1997, Appl. No. 877,300.
Int. Cl.[7] H01L *21/283;21/336*
U.S. Cl. 438—297 **20 Claims**





1. A semiconductor processing method of forming a buried contact to a substrate region comprising the following steps:

providing a masking layer over a bulk semiconductor substrate;

with the masking in place, exposing the substrate to oxidation conditions effective to grow field oxide regions in unmasked areas of the substrate and define active area substrate regions in masked areas;

after forming the field oxide regions, patterning the masking layer within at least one of the active area regions to form a buried contact mask on the substrate within the at least one active area;

with the buried contact mask in place, providing a first conductive line extending over the at least one active area and field oxide;

with the buried contact mask in place, electrically insulating the first conductive line;

with the buried contact mask in place, providing a dielectric layer within the at least one active area over unmasked substrate area;

after providing the dielectric layer, removing the patterned buried contact mask from the substrate and effectively leaving buried contact area therebeneath exposed;

providing a layer of electrically conductive material over field oxide, the insulated first conductive line and exposed buried contact area; and

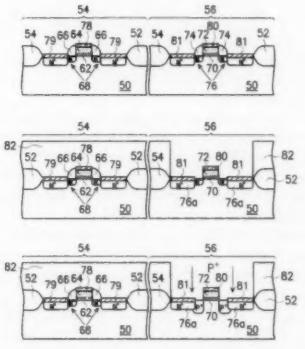
patterning the conductive material layer into a second conductive line which overlies the buried contact area.

6,040,222

METHOD FOR FABRICATING AN ELECTROSTATISTIC DISCHARGE PROTECTION DEVICE TO PROTECT AN INTEGRATED CIRCUIT

Chen-Chung Hsu, Hsinchu Hsien, and Yih-Jau Chang, Hsinchu, both of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Feb. 2, 1999, Appl. No. 241,950
Int. Cl.[7] H01L *21/336;21/8234*
U.S. Cl. 438—301 **8 Claims**



1. A method for fabricating an electrostatic discharge (ESD) protection device, which is simultaneously formed while an internal circuit is formed, wherein an isolation structure is formed on a semiconductor substrate to define a device region and a protection circuit region, a first metal-oxide semiconductor (MOS) transistor and a second MOS transistor are respectively formed on the device region and the protective circuit region, in which the first MOS transistor comprises a first gate structure and a first interchangeable source/drain region with a first lightly doped drain (LDD) structure, and the second MOS transistor comprises a second gate and a second interchangeable source/drain with a second lightly doped drain (LDD) structure, of which the second interchangeable source/drain region is doped with a first-type dopant, the method comprising:

performing a self-aligned silicide (Salicide) process over the substrate;

removing a spacer of the second MOS transistor at the protection circuit region so as to expose a portion of the second interchangeable source/drain region in the substrate, wherein the spacer is on each sidewall of the second gate of the second MOS transistor; and

implanting a second-type dopant into the exposed portion of the second interchangeable source/drain region to form a second-type dopant region so as to form a diode structure.

6,040,223

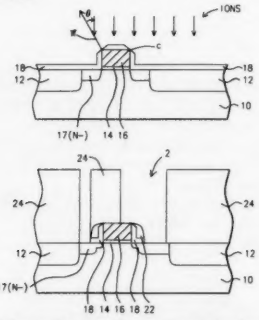
METHOD FOR MAKING IMPROVED POLYSILICON FET GATE ELECTRODES HAVING COMPOSITE SIDEWALL SPACERS USING A TRAPEZOIDAL-SHAPED INSULATING LAYER FOR MORE RELIABLE INTEGRATED CIRCUITS

Meng-Chang Liu, Chia-yi; Jyh-Feng Lin, Hua-Lien; Ming-Shu Yen, Hsin-Chu; Su-Ying Su, Taipei; Fu-Ying Chiu, YuLin, and Chien-Hung Lin, Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Aug. 13, 1999, Appl. No. 373,636

Int. Cl.[7] H01L *21/336*

U.S. Cl. 438—303 **20 Claims**



1. A method for making FET gate electrodes having composite sidewall spacers using a trapezoidal-shaped insulating layer comprising the steps of:

providing a semiconductor substrate having device areas surrounded and electrically isolated by field oxide areas;

forming a gate oxide on said device areas;

depositing a polysilicon layer on said device areas and elsewhere on said substrate, said polysilicon layer being conductively doped;

patterning said polysilicon layer to form said FET gate electrodes on said device areas;

forming lightly doped source/drain areas adjacent to said FET gate electrodes;

depositing a first insulating layer on said FET gate electrodes, said first insulating layer having a trapezoidal shape over said FET gate electrodes such that only the top edges of said FET gate electrodes are free of said first insulating layer;

depositing a conformal second insulating layer on said first insulating layer;

anisotropically plasma etching said second insulating layer to said first insulating layer to form said sidewall spacers on sidewalls of said FET gate electrodes, said first insulating layer acting as an etch endpoint detect;

removing said first insulating layer remaining on said lightly doped source/drain areas using a wet etch, while said second insulating layer protects said first insulating layer at top edges of said FET gate electrodes;

forming source/drain contact areas adjacent to said sidewalls of said FET gate electrodes in said device areas;

depositing a blanket third insulating layer on said substrate and planarizing;

etching contact openings in said third insulating layer to said source/drain contact areas, while said second insulating layer protects said first insulating layer at top edges of said FET gate electrodes when etching said contact openings that extend over said FET gate electrodes.

6,040,224

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

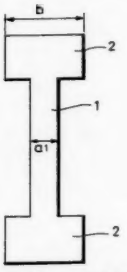
Hironori Tsukamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1997, Appl. No. 841,626

Claims priority, application Japan, Aug. 30, 1993, 5-214232

Int. Cl.[7] H01L *21/265*

U.S. Cl. 438—308 **11 Claims**



1. A method of manufacturing a semiconductor device having a microscopic region which is not damaged by laser-annealing, comprising the steps of:

forming a first region which requires heating on a semiconductor substrate at a first temperature;

forming a second region which should be protected from damage by not being heated to said first temperature on said first region, said second region having a first portion of a first width and a second portion having a width more than twice greater than that of said first portion, said second portion being integrally formed at least on one end of said first portion, wherein said width of said first portion is 0.2 μm or smaller and a length of said first portion is 10 μm or smaller; and

ion implanting selectively to said semiconductor substrate; and

laser-annealing said semiconductor substrate on which said first and second regions are formed, whereby the shape of said first and second portions protect said second region from damage during said annealing.

6,040,225

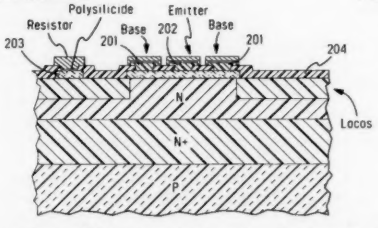
METHOD OF FABRICATING POLYSILICON BASED RESISTORS IN SI-GE HETEROJUNCTION DEVICES

Timothy Edward Boles, Tyngsboro, Mass., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 29, 1997, Appl. No. 920,639

Int. Cl.[7] H01L *21/331*

U.S. Cl. 438—314 **7 Claims**



1. A method of fabricating polysilicon based resistors in silicon-germanium heterojunction devices, the method comprising the steps of:

growing a single crystal silicon collector layer on a substrate;

growing a first oxide layer of a first thickness on said collector layer and depositing a nitride layer of a second thickness on said first oxide layer;

patterning said first oxide and said nitride layers and etching said collector layer to form a mesa;

growing an isolating layer by localized oxidation of silicon (LOCOS) of a third thickness;

removing any remaining first oxide layer and nitride layer;

growing an isolating layer by localized oxidation of silicon (LOCOS) of a fourth thickness;

depositing a layer of polysilicon on the isolating layer of a fourth thickness and selectively doping with a dopant, said polysilicon layer to form at least one resistor;

activating said dopant by heating to a predetermined temperature;

patterning and etching the polysilicon layer and the isolating layer of a fourth thickness to expose said mesa;

depositing a layer of epitaxial silicon-germanium alloy on said mesa of single crystal silicon, said silicon-germanium layer being a base layer; and

depositing a layer of single crystal silicon on said silicon-germanium layer, said layer of single crystal silicon being an emitter layer.

6,040,226

METHOD FOR FABRICATING A THIN FILM INDUCTOR

Robert John Wojnarowski, Ballston Lake; James Wilson Rose, Guilderland; Ernest Wayne Balch, Ballston Spa; Leonard Richard Douglas, Burnt Hills; Evan Taylor Downey, Niskayuna, and Michael Gdula, Knox, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of application No. 08/862,994, May 27, 1997. This application Oct. 23, 1998, Appl. No. 177,908.

Int. Cl.[7] **H01L** *21/20*

U.S. Cl. 438—381 **3 Claims**

1. A method for fabricating an inductor, comprising the steps of:

depositing a metallization layer over a base layer;

patterning the metallization layer to form a metal coil having an inductance value higher than a predetermined inductance value;

measuring the inductance value of the metal coil;

estimating the length of metal coil useful for obtaining the desired inductance value;

applying a dielectric layer over the metal coil; and

forming two vias in the dielectric layer, each of the vias extending to a respective portion of the coil and being separated along the coil by the estimated length.

6,040,227

IPO DEPOSITED WITH LOW PRESSURE O_3-TEOS FOR PLANARIZATION IN MULTI-POLY MEMORY TECHNOLOGY

Shou-Gwo Wuu, Hsinchu; Lung Chen, Hsin-Chu; Dun-Nian Yaung, and Yi-Miaw Lin, both of Taipei, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed May 29, 1998, Appl. No. 86,826

Int. Cl.[7] **H01L** *21/8244*

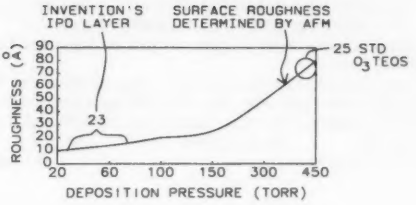
U.S. Cl. 438—382 **9 Claims**

1. A method of fabrication an inter-poly oxide (IPO) layer under a polysilicon resistor comprising:

a) providing a semiconductor structure,

b) forming an inter-poly oxide (IPO) layer over said semiconductor structure;

said inter-poly oxide (IPO) layer formed using an ozone assisted TEOS sub-atmospheric chemical vapor deposition (SACVD O_3-TEOS) process at a pressure in a range of between about 20 and 150 torr; and



c) forming a polysilicon resistor on said inter-poly oxide (IPO) layer.

6,040,228

CAPACITANCE-FORMING METHOD

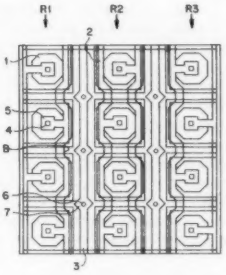
Fumihito Ito, and Guoliang Shou, both of Tokyo, Japan, assignors to Yozan, Inc., Tokyo, Japan

Filed Jun. 9, 1997, Appl. No. 871,536

Claims priority, application Japan, Jun. 7, 1996, 8-168589

Int. Cl.[7] **H01L** *21/8242*

U.S. Cl. 438—393 **6 Claims**



1. A capacitance-forming method for forming a capacitance having a predetermined capacity, comprising steps of:

i) plurally arraying an almost straight plurality of unit capacitor electrodes in a first layer in a semiconductor system;

ii) forming common electrodes in a second layer adjacent to said first layer to be faced to said unit capacitor electrodes;

iii) forming a plurality of unit capacitances by ii);

iv) forming a plurality of first and second conductors respectively connected to said first unit capacitor electrode layer and said common electrode layer in a third layer;

v) forming first and second metal terminal-contacting portions penetrating up to said third layer respectively from said unit capacitor electrodes and common electrodes;

vi) respectively connecting approximately rectangular first and second metal terminal head portions to said first and second metal terminal-contacting portions in said third layer;

vii) connecting said unit capacitor electrodes and common electrodes to said first and second conductors, respectively, through said first and second metal terminal head portions, respectively;

viii) connecting unit capacitor electrodes adjacent to each other to differnet first conductors; and

ix) parallelly connecting a predetermined number of unit capacitances;

wherein said first conductor adjacent to said second conductor is curved for detouring around said second metal terminal head portion.

6,040,229

METHOD FOR MANUFACTURING A SOLID ELECTROLYTIC CAPACITOR ARRAY

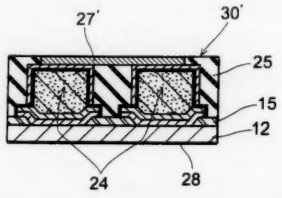
Chojiro Kuriyama, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Division of application No. 08/920,517, Aug. 29, 1997, Pat. No. 5,926,363. This application Oct. 20, 1998, Appl. No. 175,786.

Claims priority, application Japan, Aug. 30, 1996, 8-230749

Int. Cl.[7] H01L *21/20*

U.S. Cl. 438—396 **8 Claims**



1. A method for manufacturing solid electrolytic capacitor arrays, comprising steps of:

(a) preparing a motherboard having an area from which a plurality of substrates can be cutout;

(b) respectively forming a plurality of chips on said plurality of substrates included in said motherboard, each of said plurality of chips being formed by sintering metallic powder;

(c) forming a plurality of solid electrolytic layers on surfaces of said plurality of chips, respectively, in a manner that each of said plurality of solid electrolytic layers is electrically insulated from said metallic powder, said plurality of solid electrolytic layers being independent from each other;

(d) forming a covering resin layer which covers said plurality of chips in a manner that portions of said plurality of solid electrolytic layers are exposed;

(e) forming at least one cathode electrode on said covering resin layer, said cathode electrode being electrically connected to each of said plurality of solid electrolytic layers;

(f) forming at least one anode electrode on a lower surface of said motherboard, said anode electrode being electrically connected to said metallic powder of each of said plurality of chips; and

(g) cutting-out said plurality of substrates from said motherboard.

6,040,230

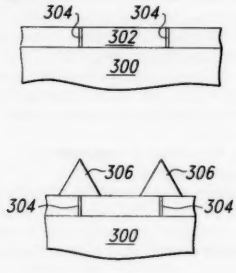
METHOD OF FORMING A NANO-RUGGED SILICON-CONTAINING LAYER

John Mark Anthony, McKinney; Robert M. Wallace, Dallas, both of Tex.; Yi Wei, Chandler, Ark., and Glen Wilk, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/045,196, Apr. 30, 1997. This application Mar. 13, 1998, Appl. No. 39,075.

Int. Cl.[7] H01L *21/20*

U.S. Cl. 438—398 **8 Claims**



1. A method of forming a nano-rugged silicon-containing layer, said method comprising the steps of:

providing a first silicon-containing layer;

providing a patterning layer over said first silicon-containing layer; said patterning layer comprised of an amorphous, conductive substance;

providing a second silicon-containing layer over said patterning layer;

and wherein said patterning layer creates a nano-rugged texture in said second silicon-containing layer.

6,040,231

METHOD OF FABRICATING A SHALLOW TRENCH ISOLATION STRUCTURE WHICH INCLUDES USING A SALICIDE PROCESS TO FORM AN ASLOPE PERIPHERY AT THE TOP CORNER OF THE SUBSTRATE

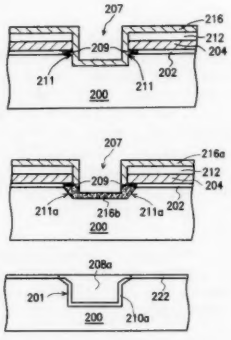
Der-Yuan Wu, Hsinchu, Taiwan, assignor to United Microelectronics Corp., Hsin-Chu, Taiwan

Filed Apr. 6, 1998, Appl. No. 55,684

Claims priority, application Taiwan, Jan. 23, 1998, 87100940

Int. Cl.[7] H01L *21/76;21/311*

U.S. Cl. 438—424 **47 Claims**



1. A method of fabricating a shallow trench isolation structure, comprising:

providing a substrate;

forming a first oxide layer, a stop layer and a second oxide layer successively on the substrate, wherein the first oxide layer has a periphery;

patterning the second oxide layer, the stop layer and the first oxide layer and a portion of the substrate to form a trench;

forming a recess at the periphery of the first oxide layer;

forming a metal layer at the trench and the recess;

performing a thermal treatment process so that a portion of the metal layer contacting with the substrate transforms to be a metal silicide layer; and

removing the metal silicide layer and the rest of the metal layer so that the top corner of the substrate becomes an aslope periphery.

6,040,232

METHOD OF MANUFACTURING SHALLOW TRENCH ISOLATION

Jing-Horng Gau, Nan-Tou Hsien, Taiwan, assignor to United Semiconductor Corp., Hsinchu, Taiwan

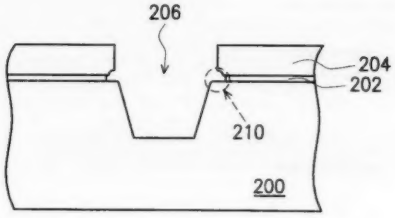
Filed Jan. 25, 1999, Appl. No. 236,955

Claims priority, application Taiwan, Nov. 6, 1998, 87118504

Int. Cl.[7] H01L *21/76*

U.S. Cl. 438—424 **11 Claims**

1. A method of manufacturing a shallow trench isolation suitable for a substrate having a pad oxide layer and a mask layer in



sequence, a trench penetrating through the mask layer and the pad oxide layer and into the substrate defining a sidewall of the mask layer, a sidewall of the pad oxide layer and exposed surface of the substrate, and a first liner oxide layer covering the sidewall of the pad oxide layer and the exposed surface of the substrate, the method comprising the steps of:

stripping away a portion of the first liner oxide layer to expose a bottom corner of the sidewall of the mask layer;

stripping away a portion of the mask layer from its sidewall and bottom corner to expose a top corner of the first oxide layer adjacent and connected to the sidewall of the pad oxide layer;

removing the first liner oxide layer;

forming a second liner oxide layer on the sidewall and the base surface of the trench; and

filling the trench with an insulating material to form a shallow trench isolation.

6,040,233

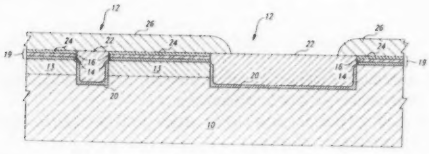
METHOD OF MAKING A SHALLOW TRENCH ISOLATION WITH THIN NITRIDE AS GATE DIELECTRIC

Robert Louis Hodges, Phoenix, Ariz., assignor to STMicroelectronics, Inc., Carrollton, Tex.

Division of application No. 08/986,271, Dec. 5, 1997, Pat. No. 5,952,707. This application May 11, 1999, Appl. No. 309,935.

Int. Cl.[7] H01L *29/51*

U.S. Cl. 438—427 **16 Claims**



1. A method of forming a semiconductor device comprising:

forming a dielectric layer atop a surface of a substrate, said substrate having a first conductivity type and including wells of a second conductivity type and contacts of the first conductivity type formed on said surface, said dielectric layer including a top component comprising silicon dioxide having a thickness of less than ten angstroms;

forming openings in said dielectric layer;

etching trenches through said wells in said openings;

forming an oxide atop said surface and in said trenches, said oxide having a thickness greater than a depth of said trenches;

removing that portion of said oxide extending above said surface by more than a height of said dielectric layer; and

forming transistors using said dielectric layer as a gate dielectric.

6,040,234

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITHOUT BIRD BEAK EFFECT

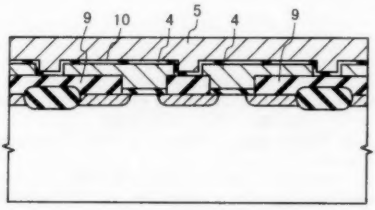
Yosiaki Hisamune, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 23, 1997, Appl. No. 881,024

Claims priority, application Japan, Jul. 30, 1996, 8-200708

Int. Cl.[7] H01L *21/225;21/76*

U.S. Cl. 438—439 **15 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a field oxide film on said semiconductor substrate;

forming a mask film on said semiconductor substrate which is uncovered by said field oxide film;

forming diffusion layers on said semiconductor substrate using said mask film and said field oxide film as a mask, said diffusion layers having a conductive type different from that of said semiconductor substrate;

forming insulating films on said diffusion layers;

removing said mask film;

forming a polysilicon floating gate between said insulating films on said semiconductor substrate via a first gate insulating film;

forming a second gate insulating film on said polysilicon floating gate and said insulating films; and

forming a word line to cover said polysilicon floating gate via said second gate insulating film.

6,040,235

METHODS AND APPARATUS FOR PRODUCING INTEGRATED CIRCUIT DEVICES

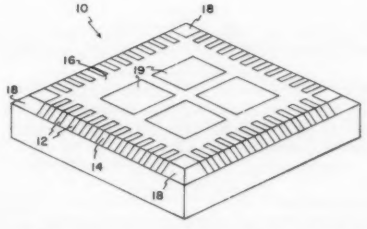
Pierre Badehi, Mobile Post Harei Yehuda, Israel, assignor to Shellcase Ltd., Jerusalem, Israel

PCT No. PCT/EP95/00097, § 371 Date Aug. 19, 1996, § 102(e) Date Aug. 19, 1996, PCT Pub. No. WO95/19645, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 10, 1995, Appl. No. 682,556

Int. Cl.[7] H01L *21/301;21/46;21/78*

U.S. Cl. 438—464 **26 Claims**



1. A method for producing integrated circuit devices including the steps of:

producing a plurality of integrated circuits on a wafer having first and second planar surfaces, each of the integrated circuits including a multiplicity of pads;

waferwise attaching to both said surfaces of the wafer a layer of protective material;

thereafter partially cutting into the wafer and the protective material attached thereto, thereby to define notches along outlines of a plurality of prepackaged integrated circuit devices;

forming metal contacts onto the plurality of prepackaged integrated circuit devices while they are still joined together on the wafer, at least a portion of said metal contacts extending into the notches; and

thereafter separating the plurality of prepackaged integrated circuit devices into individual devices.

6,040,236

METHOD FOR MANUFACTURING SILICON THIN FILM CONDUCTIVE ELEMENT

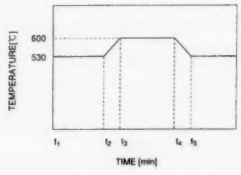
Fumiki Aiso, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

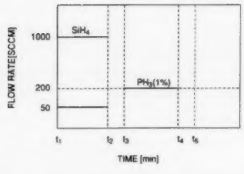
Filed Sep. 2, 1997, Appl. No. 923,746

Claims priority, application Japan, Sep. 6, 1996, 8-236020

Int. Cl.[7] **H01L** *21/22*

U.S. Cl. 438—486 **8 Claims**





1. A method of manufacturing a silicon thin film conductive element comprising the steps of :

forming, after the formation of an impurity-containing amorphous silicon film, an impurity glass layer on a surface by the use of a gas containing the impurity and an oxide gas without removing the film from a film forming device; and subsequently

crystallizing said amorphous silicon film by heat treatment.

6,040,237

FABRICATION OF A SIC SEMICONDUCTOR DEVICE COMPRISING A PN JUNCTION WITH A VOLTAGE ABSORBING EDGE

Mietek Bakowski, Skultuna; Ulf Gustafsson, Linkoping; Kurt Rottner, Kista, and Susan Savage, Jarfalla, all of Sweden, assignors to ABB Research Ltd., Zurich, Switzerland

Division of application No. 08/683,059, Jul. 16, 1996. This application Oct. 23, 1997, Appl. No. 956,959.

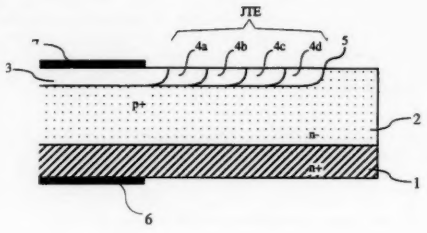
Int. Cl.[7] **H01L** *21/26*

U.S. Cl. 438—521 **9 Claims**

1. A method of manufacturing a semiconductor component, said method comprising the steps of:

forming a lower doped layer of the first conducting type in a silicon carbide wafer at the surface of the wafer;

forming a higher doped anode layer of the second conducting type at the surface of and in said silicon carbide wafer, said lower doped layer and said anode forming a planar pn junction;



masking an area of the wafer adjacent a prospective first zone not to be implanted; and

implanting an implant in the exposed area of the wafer, thus forming a first junction termination extension zone of the second conducting type surrounding the anode, wherein the implantation dose is such that the effective sheet charge density in the first zone is at most equal to the characteristic sheet charge density Q_0, corresponding to a doping such that the zone is completely depleted at full design voltage.

6,040,238

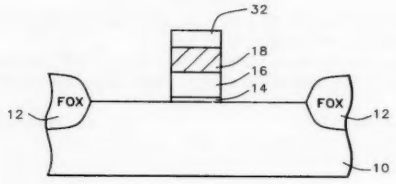
THERMAL ANNEALING FOR PREVENTING POLYCIDE VOID

Chie-Ming Yang; Jih-Hwa Wang, and Yen-Yi Lin, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Jan. 8, 1998, Appl. No. 4,190

Int. Cl.[7] **H01L** *21/3205;21/4763*

U.S. Cl. 438—592 **15 Claims**



1. A method of fabricating gate electrodes in the manufacture of an integrated circuit device comprising:

growing a layer of gate silicon oxide over the surface of a semiconductor substrate;

depositing a polysilicon layer overlying said gate silicon oxide layer;

forming a tungsten silicide layer overlying said polysilicon layer;

thermally annealing said tungsten silicide layer at a temperature of 750 to 850° C. for 20 to 60 seconds whereby said tungsten silicide layer is stabilized and stress relaxed;

thereafter depositing a hard mask layer overlying said tungsten silicide layer wherein said annealing step prevents silicon atoms from diffusing out of said polysilicon layer into said tungsten silicide layer and causing voids in said polysilicon layer and wherein the absence of said voids prevents the formation of silicon pits in said semiconductor substrate; and

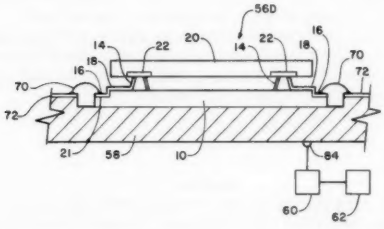
patterning said hard mask, said tungsten silicide, said polysilicon and said gate silicon oxide layers to complete fabrication of said gate electrodes in the manufacture of said integrated circuit device.

6,040,239

NON-OXIDIZING TOUCH CONTACT INTERCONNECT FOR SEMICONDUCTOR TEST SYSTEMS AND METHOD OF FABRICATION

Salman Akram, Boise, and Warren M. Farnworth, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 22, 1997, Appl. No. 916,892
Int. Cl.[7] H01L *21/44;21/66*
U.S. Cl. 438—612 47 Claims



1. A method for fabricating an interconnect for testing a semiconductor component having a contact comprising:

providing a substrate;

forming a contact member on the substrate configured for contacting the contact on the component;

forming a conductive layer on the contact member;

electrolessly depositing a barrier layer on the conductive layer comprising a first material configured to prevent diffusion of the conductive layer; and

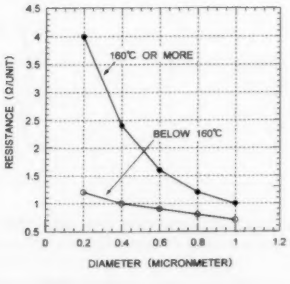
electrolessly depositing a non-oxidizing layer on the barrier layer comprising a second material configured to provide a touch surface on the contact member for making a temporary electrical connection with the contact on the component.

6,040,240

METHOD FOR FORMING INTERCONNECTION STRUCTURE

Yoshihisa Matsubara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 28, 1999, Appl. No. 300,439
Claims priority, application Japan, Apr. 30, 1998, 10-120494
Int. Cl.[7] H01L *21/44*
U.S. Cl. 438—618 9 Claims



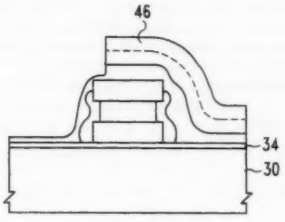
1. A method for forming an interconnection structure the steps of: forming an exposed copper interconnect overlying on a substrate to form a wafer, thermally treating the wafer in a thermal treatment furnace under a non-oxidizable atmosphere, dropping a temperature of the copper interconnect below 160° C. under the non-oxidizable atmosphere and exposing the wafer thermally treated to atmosphere for cooling the wafer.

6,040,241

METHOD OF AVOIDING SIDEWALL RESIDUE IN FORMING CONNECTIONS

Tzung-Han Lee, Taipei, and Horng-Nan Chern, Tainan, both of Taiwan, assignors to United Microelectronics Corp., Hsin-chu, Taiwan

Filed Feb. 11, 1998, Appl. No. 21,750
Int. Cl.[7] H01L *21/336*
U.S. Cl. 438—622 13 Claims



1. A method for forming insulation over conductor, said method comprising the steps of:

providing a substrate with a gate structure formed over, wherein said gate structure includes:

a polysilicon layer over said substrate;

a tungsten silicide layer over said polysilicon layer;

an upper insulator layer over said tungsten silicide layer; and

insulator spacers with a recessed region covering conformably on sidewalls of said upper insulator layer, said tungsten silicide layer and said polysilicon layer;

forming a dielectric layer over said gate structure and said substrate; and

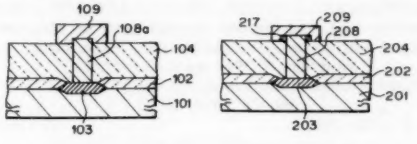
performing an etching back process to remove a portion of said dielectric layer for thinning said dielectric layer and having a recess free sidewall on said dielectric layer around said gate structure.

6,040,242

METHOD OF MANUFACTURING A CONTACT PLUG

Eiichirou Kakehashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1997, Appl. No. 804,352
Claims priority, application Japan, Feb. 28, 1996, 8-041164
Int. Cl.[7] H01L *21/28*
U.S. Cl. 438—672 17 Claims



6. A method of manufacturing a semiconductor device, comprising:

a first step of forming a first insulating film on a semiconductor substrate;

a second step of forming a first film which can be selectively etched to said first insulating film, and of forming a second insulating film on said first film;

a third step of forming an opening which reaches said first insulating film in an area where a contact hole is to be formed;

a fourth step of forming a spacer on a side surface of said opening;

a fifth step of forming said contact hole which reaches said semiconductor substrate by selectively etching said second insulating film and said first insulating film to said spacer and said first film;

a sixth step of forming a second film to fill said contact hole and cover said first film and said spacer;

a seventh step of forming a buried contact plug filling said contact hole by etching said second film, said spacer and said first film to expose said first insulating film.

6,040,243

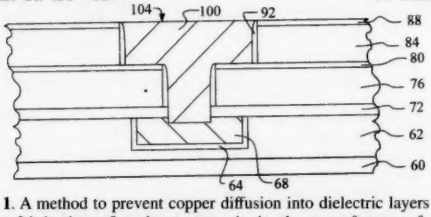
METHOD TO FORM COPPER DAMASCENE INTERCONNECTS USING A REVERSE BARRIER METAL SCHEME TO ELIMINATE COPPER DIFFUSION

Jianxun Li; Simon Chooi, and Mei-Sheng Zhou, all of Singapore, Singapore, assignors to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore

Filed Sep. 20, 1999, Appl. No. 398,292

Int. Cl.[7] H01L *21/44*

U.S. Cl. 438—687 **20 Claims**



1. A method to prevent copper diffusion into dielectric layers in the fabrication of a damascene via in the manufacture of an integrated circuit device comprising:

providing copper traces through an isolation layer overlying a semiconductor substrate;

depositing a passivation layer overlying said copper traces and said isolation layer;

depositing a dielectric layer overlying said passivation layer;

depositing a cap layer overlying said dielectric layer;

patterning said cap layer and said dielectric layer to form an opening for planned said damascene via and to expose the top surface of said passivation layer overlying said copper traces;

depositing a barrier layer overlying said passivation layer and said dielectric layer;

etching through said barrier layer to expose the top surfaces of said passivation layer and said cap layer wherein remaining said barrier layer isolates sidewalls of said opening; and

etching through said passivation layer to the top surface of said copper traces to complete said damascene via in the manufacture of said integrated circuit device.

6,040,244

POLISHING PAD CONTROL METHOD AND APPARATUS

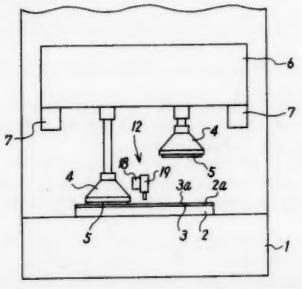
Hatsuyuki Arai, and Yasushi Ikeyama, both of Kanagawa, Japan, assignors to Speedfam Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1997, Appl. No. 927,314

Claims priority, application Japan, Sep. 11, 1996, 8-262575

Int. Cl.[7] H01L *21/302*

U.S. Cl. 438—691 **17 Claims**



1. A method for monitoring and controlling accuracy of a polishing pad adhered to a surface plate mounted on a machine for polishing wafers comprising the steps of:

scanning a surface of said plate with a sensor, prior to adhesion of said pad to said plate, to measure a position of said plate surface;

inputting said surface position into a controlling means to be used as a reference surface for measuring thickness of said pad;

adhering said pad to said plate surface;

scanning said pad with said sensor prior to polishing to measure pre-polishing thickness and contour of said pad;

polishing said wafers;

scanning said pad with said sensor after polishing to measure post-polishing thickness and contour of said pad; and

outputting from said controlling means a pad conditioning signal or a pad replacement signal based on differences between said pre-polishing pad thickness and contour and said post-polishing pad thickness and contour.

6,040,245

IC MECHANICAL PLANARIZATION PROCESS INCORPORATING TWO SLURRY COMPOSITIONS FOR FASTER MATERIAL REMOVAL TIMES

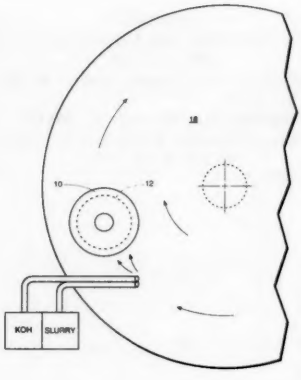
Gurtej S. Sandhu; Richard L. Elliott; Trung T. Doan, and Jody D. Larsen, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/992,399, Dec. 17, 1997, which is a continuation of application No. 08/692,903, Jul. 30, 1996, abandoned, which is a continuation of application No. 08/493,205, Jun. 20, 1995, Pat. No. 5,540,810, which is a continuation of application No. 08/109,848, Aug. 20, 1993, abandoned, which is a continuation of application No. 07/989,243, Dec. 11, 1992, abandoned. This application May 12, 1999, Appl. No. 310,506.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01L *21/304*

U.S. Cl. 438—692 **4 Claims**



1. A method of planarizing a wafer, comprising steps of:

providing a wafer having at least one layer of material over a substrate;

supplying a chemical mechanical planarization solution and a pH adjusting solution as a to slurry mixture;

chemical mechanical planarizing said wafer using said slurry mixture and removing at least a first portion of said one layer of material; and

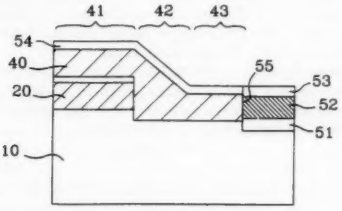
after removing said first portion of said one layer of material, altering a flow ratio of said pH adjusting solution relative said chemical mechanical planarization solution and continuing said chemical mechanical planarizing of said water.

6,040,246

METHOD OF MANUFACTURING AN INTEGRATED OPTICAL COMPONENT COMPRISING A THICK WAVEGUIDE COUPLED TO A THIN WAVEGUIDE

Léon Goldstein, Chaville; Denis Leclerc, Igny, and Béatrice Dagens, Paris, all of France, assignors to Alcatel, Paris, France

Filed Sep. 8, 1998, Appl. No. 148,480
Claims priority, application France, Sep. 11, 1997, 97 11298
Int. Cl.[7] **H01L** *21/02;21/20;21/3065;* **G02B** *6/13;6/136*
U.S. Cl. 438—706 **6 Claims**



1. A method of manufacturing an integrated optical component comprising a thick waveguide coupled to a thin waveguide via a coupling interface, said method consisting in:

depositing a first guiding layer of said thick waveguide on a substrate;

locally etching said first guiding layer over a portion allocated both to the coupling interface and to the thin waveguide;

depositing a second guiding layer on the first guiding layer and on the locally etched portion so as to form said thick waveguide in a manner such that it has a maximum thickness in a first zone, a graded-thickness section in a second zone, and a reduced-thickness section in a third zone;

locally etching the second guiding layer over a portion of the third zone, said portion being allocated to the thin waveguide; and

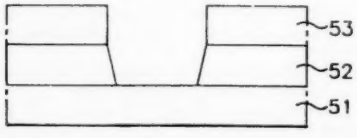
depositing a third guiding layer in said portion of said third zone so as to form said thin waveguide.

6,040,247

METHOD FOR ETCHING CONTACT

Seong Woo Chung, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Continuation of application No. 08/371,070, Jan. 10, 1995, abandoned. This application Jan. 7, 1997, Appl. No. 779,744.
Int. Cl.[7] **H01L** *21/302*
U.S. Cl. 438—713 **2 Claims**



1. A method for forming a semiconductor device comprising the steps of:

providing an insulation layer on a substrate;

exposing a portion of said insulation layer by providing a photoresist pattern on said insulation layer;

performing a first etching step of said insulation layer, said first etching step including the steps of:

introducing into an etching chamber a first gas including CF_4, a second gas including a polymer forming gas, other than CF_4, and a third gas including an inert gas; and

controlling a first flow rate of said inert gas to have a first flow rate value; and

performing a second etching step of said insulation layer, said second etching step ;including the step of controlling a second flow rate of said inert gas to have a second flow rate value, said second flow rate value being greater than said first flow rate value,

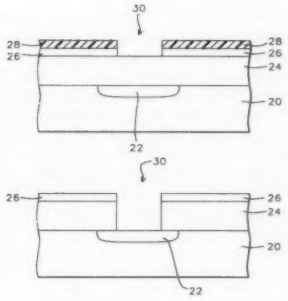
wherein said second etching step yields a contact hole in said insulation layer having sloped sidewalls.

6,040,248

CHEMISTRY FOR ETCHING ORGANIC LOW-K MATERIALS

Chao-Cheng Chen, Matou; Ming-Hsin Huang, Hsin-chu; Hun-Jan Tao, Hsin-chu, and Chia-Shiung Tsai, Hsin-chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Jun. 24, 1998, Appl. No. 104,032
Int. Cl.[7] **H01L** *21/302;21/461;* **C23F** *1/02*
U.S. Cl. 438—725 **18 Claims**



7. A method for forming a contact on a semiconductor wafer comprising:

(a) providing a semiconductor wafer;

(b) forming a organic polymer layer on said semiconductor wafer;

(c) patterning a hardmask on said organic polymer layer;

(d) anisotropically etching said organic polymer layer in a high density plasma) etcher with an etchant gas containing oxygen and chlorine, under conditions which preserve the pattern integrity of the hardmask and form an essentially un-bowed, vertical profiled opening; and

(e) forming a conductive contact in said opening.

6,040,249

METHOD OF IMPROVING DIFFUSION BARRIER PROPERTIES OF GATE OXIDES BY APPLYING IONS OR FREE RADICALS OF NITROGEN IN LOW ENERGY

Thomas C. Holloway, Murphy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 8, 1997, Appl. No. 907,668
Int. Cl.[7] **H01L** *21/318*
U.S. Cl. 438—769 **14 Claims**

1. A method of providing a MOSFET having improved gate oxide diffusion barrier properties, comprising the steps of:

(a) providing a partially fabricated MOSFET having an exposed gate oxide surface;

(b) converting the surface of said exposed gate oxide to an oxynitride by a very low energy implant of nitrogen into said exposed gate oxide surface wherein said low energy is from about 50 eV to about 1000 eV; and

(c) completing fabrication of said MOSFET.

6,040,250

MULTI-LAYER THERMOFORMABLE LAMINATES AND METHODS OF THEIR MANUFACTURE

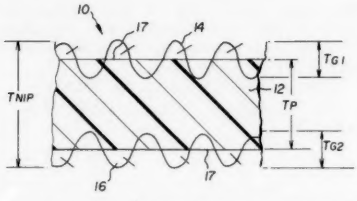
William C. Paul, Mt. Vernon, and Gloria Sieloff, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Division of application No. 08/575,006, Dec. 19, 1995, Pat. No. 5,895,709, which is a continuation of application No. 08/265,528, Jun. 24, 1994, abandoned. This application Jun. 9, 1998, Appl. No. 94,147.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **B32B** *5/18;5/28*

U.S. Cl. 442—61 **15 Claims**



1. A thermoformable multi-layer laminate structure having been made by a process comprising the steps of:

forming a polymer layer of an at least partially molten thermoplastic polymeric material having opposite sides;

superposing first and second layers of glass cloth materials in confronting relationship with said partially molten thermoplastic polymer layer on the opposite sides thereof; and

passing the superposed layers through a compression nip providing a gap which is less than the combined thickness of the layers and engaging free surfaces of said glass cloth layers with the partially molten thermoplastic polymeric material therebetween whereby the compression nip forces said partially molten thermoplastic polymer layers to flow into and impregnate the first and second glass cloth layers and said free surfaces of said glass cloth layers protrude from said polymer layer to form a core structure.

6,040,251

GARMENTS OF BARRIER WEBS

J. Michael Caldwell, Cardiff, Calif., assignor to Nextec Applications Inc., Vista, Calif.

Continuation-in-part of application No. 08/472,568, Jun. 7, 1995, Pat. No. 5,874,164, which is a continuation-in-part of application No. 08/442,983, May 17, 1995, Pat. No. 5,869,172, which is a continuation-in-part of application No. 08/407,191, Mar. 17, 1995, Pat. No. 5,876,792, which is a continuation-in-part of application No. 08/017,855, Feb. 16, 1993, Pat. No. 5,418,051, which is a continuation of application No. 07/680,645, Apr. 2, 1991, Pat. No. 5,209,965, which is a continuation of application No. 07/319,778, Mar. 10, 1989, Pat. No. 5,004,643, which is a continuation-in-part of application No. 07/167,630, Mar. 14, 1988, and a continuation-in-part of application No. 07/167,643, Mar. 14, 1988, and a continuation-in-part of application No. 07/167,797, Mar. 14, 1988, and a continuation-in-part of application No. 07/167,869, Mar. 14, 1988. This application Jun. 7, 1995, Appl. No. 472,480.

Int. Cl.[7] **A01N** *25/34;* **A61B** *19/08;* **A61F** *13/15;13/46*

U.S. Cl. 442—123 **23 Claims**

1. An absorbent garment comprising:

an absorbent pad; and

at least one layer of a web, wherein the web comprises a plurality of web members with interstices therebetween and an at least partially cured polymer composition derived from a shear-thinable thixotropic polymer, wherein the web is adapted to be, when the polymer is in the fully cured state:

substantially impermeable to liquids;

permeable to selective gases; and

substantially impermeable to selective biological materials due to the presence in the cured polymer of one or more modifiers capable of interacting with the biological materials.

6,040,252

LAMINATE BASE MATERIAL, A METHOD OF PRODUCING THE SAME, A PREPREG AND A LAMINATE

Minoru Ootuka; Hirokazu Hiraoka; Toru Shimadu, and Masayuki Noda, all of Hikone, Japan, assignors to Shin-Kobe Electric Machinery Co., Tokyo; Teijin Limited, Osaka, and Oji Paper Co., Ltd., Tokyo, all of Japan

Division of application No. 08/803,943, Feb. 21, 1997, Pat. No. 5,948,543. This application Apr. 21, 1999, Appl. No. 295,954.

Claims priority, application Japan, Feb. 21, 1996, 8-33446; Aug. 4, 1996, 8-233814; Jan. 8, 1997, 9-1163

Int. Cl.[7] **B32B** *27/34*

U.S. Cl. 442—169 **20 Claims**

1. A prepreg comprising sheet-like laminate base material impregnated with thermosetting resin and dried, said sheet-like laminate base material consisting of a combined non-woven fabric of para-aramid fibers and thermoplastic resin fibers having a softening temperature of 220° C. and higher, said para-aramid fibers and said thermoplastic resin fibers being bonded by a resin binder in an open matrix for receipt of impregnating resin with said thermoplastic resin fibers adhered to each other and to said para-aramid fibers in a molten manner.

6,040,253

PRESS PAD FOR HIGH-PRESSURE AND LOW-PRESSURE PRESSES

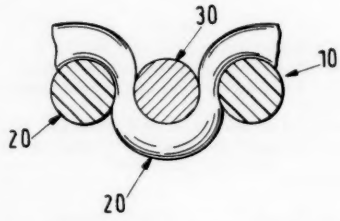
Bruno Hennecken, Aachen, Germany, assignor to Rheinische Filztuchfabrik GmbH, Stolberg/Rhld., Germany

Filed Nov. 27, 1995, Appl. No. 562,871

Claims priority, application Germany, Nov. 25, 1994, 94 18 984 U

Int. Cl.[7] **D03D** *15/00*

U.S. Cl. 442—239 **6 Claims**



1. A press pad which is made of asbestos-free material, consisting essentially of:

at least one yarn of Group I in combination with at least one yarn of Group II, wherein Group I includes:

(A) yarn comprised of filaments of at least one aromatic polyamide and filaments of at least one metallic material selected from the group consisting of metals and metal alloys; and

(B) yarn comprised of filaments of at least one metallic material selected from the group consisting of metals and metal alloys, and

wherein Group II includes:

(A) filaments which are comprised of one of at least one silicone polymer or a mixture of filaments of different silicone polymers and which are heat resistant, and

(B) filaments which are comprised of an outer layer and a metallic core, the outer layer being composed of filaments of at least one material from Group II (A) or (B), and the metallic core being composed of at least one filament of at

least one metallic material selected from the group consisting of metals and metal alloys, and being one of fixedly connected with the outer layer or not fixedly connected with the outer layer; and

(C) wrapped filaments which are comprised of filaments of at least one material from Group II (A) or (B) and which are wrapped by metallic filaments composed of at least one metallic material selected from the group consisting of metals and metal alloys, and

wherein the press pad does not include asbestos.

6,040,254

DUSTPROOF FABRIC WORN IN A CLEAN ROOM

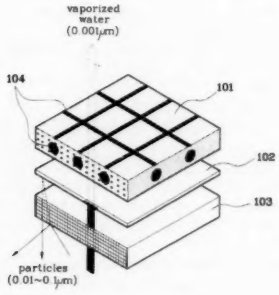
Chang-su Lim, Kyungki-do; Hyeog-ki Kim, Seoul; Sue-ryeon Kim, Kyungki-do, and Il-kyoung Kim, Kyoungsanbuk-do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 8, 1998, Appl. No. 168,095

Claims priority, application Rep. of Korea, Dec. 24, 1997, 97-73509

Int. Cl.[7] **B32B** *3/00*

U.S. Cl. 442—261 **17 Claims**



1. A dustproof fabric comprising:

an inner layer comprising a knit fabric;

an intermediate layer attached to said inner layer and comprising a non-micro porous and moisture absorbent polyurethane resin film; and

an outer layer attached to said intermediate layer opposite said inner layer, said outer layer comprising a high density woven fabric of polyester yarns, a first set of spaced apart conductive yarns aligned with one another in the direction of the warp of the woven fabric, and a second set of spaced apart conductive yarns aligned with one another in the direction of the weft of the woven fabric.

6,040,255

PHOTOSTABILIZATION PACKAGE USABLE IN NONWOVEN FABRICS AND NONWOVEN FABRICS CONTAINING SAME

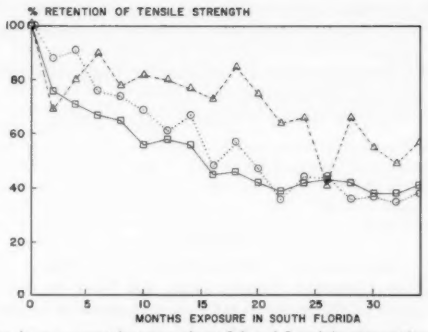
Robert Leslie Hudson, Roswell, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 25, 1996, Appl. No. 673,606

Int. Cl.[7] **D04H** *3/00*

U.S. Cl. 442—382 **13 Claims**

1. A nonwoven fabric comprising a polymer selected from the group consisting of polyolefins and a stabilizing additive package consisting essentially of a bismuth vanadate based pigment in an amount between about 0.1 and 3 weight percent based upon the weight of the nonwoven fabric and a hindered amine light stabilizer in an amount between about 0.1 and 3 weight percent based upon the weight of the nonwoven fabric.



6,040,256

METHOD FOR PRODUCING A REACTION SINTERED CERAMIC

Hideki Kita, Fujisawa, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Fujisawa, Japan

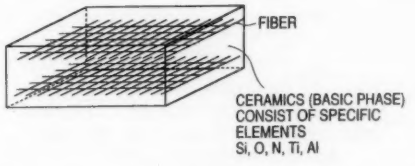
Continuation of application No. 08/787,995, Jan. 23, 1997, abandoned, which is a continuation of application No. 08/498,304, Jul. 3, 1995, abandoned, which is a continuation of application No. 08/321,776, Oct. 12, 1994, abandoned. This application Jan. 23, 1997, Appl. No. 787,995.

Claims priority, application Japan, Oct. 12, 1993, 5-278959; Feb. 8, 1994, 6-035500; Mar. 31, 1994, 6-085410

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C04B** *35/58*

U.S. Cl. 501—97.1 **11 Claims**



1. A method for making one of a SIALON and Si_3N_4 reaction sintered ceramic, comprising the steps of:

forming a green composition from a mixture of about 20–65 weight % of a powder of Si and about 35–49 weight % of an oxide including Al and O;

reaction sintering said green composition at about 1400° C. to 1450° C. in an atmosphere of nitrogen gas;

heating at a temperature range of about 1000° C. to 1700° C. while oxidizing said sintered composition in an oxidation atmosphere to a nitride phase having a porosity of 15% or less.

6,040,257

HYDROCARBON CONVERSION CATALYST COMPOSITION AND PROCESSES THEREFOR AND THEREWITH

Charles A. Drake, Nowata; An-hsiang Wu, and Jianhua Yao, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 7, 1997, Appl. No. 966,137

Int. Cl.[7] **B01J** *29/06;21/00;21/16;27/14*

U.S. Cl. 502—64 **3 Claims**

1. A process for the preparation of a catalyst suitable for the conversion of a hydrocarbon to a C_6 to C_8 aromatic hydrocarbon and an olefin which comprises

(A) combining a ZSM-5 zeolite with a clay wherein the ratio of clay to zeolite is in the range of from about 1:20 to about 20:1;

(B) contacting the resulting zeolite-clay composition of (A) with ammonium phosphate; and thereafter

(C) heating the resulting composition of (B) with steam.

6,040,258

ZEOLITE CIT-5 AND METHOD OF MAKING

Masahito Yoshikawa, Nagoya, Japan, and Mark E. Davis, Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of application No. 08/910,770, Aug. 13, 1997. This application Jul. 21, 1998, Appl. No. 119,806.

Int. Cl.[7] B01J *29/06*

U.S. Cl. 502—64 **33 Claims**

1. A zeolite comprising an oxide of a tetravalent element or mixture of oxides of tetravalent elements and, optionally, an oxide of a trivalent element or mixtures of oxides of trivalent elements and having, after calcination, the X-ray diffraction lines of Table II.

14. A method of preparing a crystalline material comprising an oxide of a tetravalent element or mixture of oxides of tetravalent elements and, optionally, an oxide of a trivalent element or mixtures of oxides of trivalent elements, and having, after calcination, the X-ray diffraction pattern lines of Table II, said method comprising contacting in admixture under crystallization conditions sources of said oxides, a source of alkali metal comprising lithium, and a templating agent comprising a N(16) methylsparteinium cation.

6,040,259

METAL-CONTAINING ZEOLITE CATALYST, PREPARATION THEREOF AND USE FOR HYDROCARBON CONVERSION

Gary David Mohr, League City, Tex., and Johannes Petrus Verduijn, Rotterdam, Netherlands, assignors to Exxon Chemical Patents Inc., Houston, Tex.

Provisional application No. 60/018,583, May 29, 1996. This application May 29, 1997, Appl. No. 865,727.

Int. Cl.[7] B01J *29/06*

U.S. Cl. 502—67 **41 Claims**

1. A zeolite bound zeolite hydrocarbon conversion catalyst which does not contain significant amounts of non-zeolitic binder and contains at least one hydrogenation/dehydrogenation metal and comprises:

(a) first crystals of a first zeolite, and

(b) a binder comprising second crystals of a second zeolite; and

(c) an effective amount of at least one hydrogenation/dehydrogenation metal:

wherein said zeolite bound zeolite catalyst is prepared by (i) providing said first crystals of said first zeolite; (ii) forming a silica bound aggregate comprising at least a portion of said at least one hydrogenation/dehydrogenation metal and said first crystals of said first zeolite; and (iii) converting to said second zeolite the silica binder of said silica bound aggregate, wherein said portion of said at least one hydrogenation/dehydrogenation metal is added during the preparation of said zeolite bound zeolite hydrocarbon conversion catalyst after step (i).

6,040,260

PROCESS FOR THE PREPARATION OF REPOLYMERIZED CATALYST COMPOSITION AND A PROCESS FOR POLYMERIZING α-OLEFINS

Ismo Pentti, Kulloo, and Pauli Leskinen, Helsinki, both of Finland, assignors to Borealis A/S, Lyngby, Denmark

Division of application No. 08/571,029, Dec. 12, 1995, Pat. No. 5,641,721, which is a continuation of application No. 08/174,787, Dec. 29, 1993, abandoned. This application Jun. 16, 1997, Appl. No. 876,442.

Claims priority, application Finland, Dec. 29, 1992, 925913

Int. Cl.[7] C08F *4/654*

U.S. Cl. 502—103 **12 Claims**

1. A process for preparing a catalyst comprising

(a) forming a procatalyst composition by depositing a transition metal compound on a suitable support;

(b) adding said procatalyst composition to a viscous substance having a viscosity of from 1,000 to 15,000 cP;

(c) prepolymerizing said procatalyst composition with a prepolymerization monomer in the presence of said viscous substance to obtain a prepolymerized catalyst composition.

6,040,261

SUPPORTED SINGLE-SITE CATALYST AND OLEFIN POLYMERIZATION PROCESS

Gregory G. Hlatky, Morrow, Ohio, assignor to Equistar Chemicals, LP, Houston, Tex.

Filed Apr. 15, 1999, Appl. No. 292,370

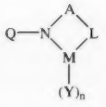
Int. Cl.[7] B01J *31/00*

U.S. Cl. 502—117 **16 Claims**

1. A process which comprises:

(a) reacting an amine-functionalized support of the structure: Q—NH_2 wherein Q is an inorganic solid or polymer support, with a compound of the formula X—A—L, wherein X is a leaving group, A is a linking group, and L is a polymerization-stable pi-bonded ancillary ligand that is covalently bonded to A, to produce a supported ligand of the formula: Q—NH—A—L; and

(b) reacting the supported ligand with a transition or lanthanide metal compound to produce a tethered catalyst of the structure:



where M is a Group 3 to 10 transition or lanthanide metal, Y is a ligand selected from the group consisting of halide, alkoxy, siloxy, dialkylamino, C_1–C_{10} alkyl, C_6–C_{15} aryl, C_7–C_{15} alkaryl or aralkyl, and n is the number of Y groups and equals the valence of M minus 2.

6,040,262

CATALYST AND USE THEREOF

Christoph Martin Fougret, Falkirk, United Kingdom, and Wolfgang Friederich Holderich, Frankenthal, Germany, assignors to BP Chemicals Limited, London, United Kingdom

Filed Mar. 10, 1999, Appl. No. 265,567

Claims priority, application United Kingdom, Mar. 10, 1998, 9805107

Int. Cl.[7] B01J *31/00;27/14;27/198;27/188;27/19*

U.S. Cl. 502—162 **10 Claims**

1. A catalyst composition comprising an acid supported on carrier characterised in that said composition comprises in addition an amino compound wherein said amino compound is non-ionic or cationic.

6,040,263

CATALYTIC COMPOSITION BASED ON TRANSITION METAL COMPLEXES, AND A PROCESS FOR THE HYDROGENATION OF UNSATURATED COMPOUNDS

Lothar Mussmann, Hanau-Wolgang, Germany; Yves Chauvin, Le Peco, and Helene Olivier, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, France

Division of application No. 08/664,539, Jun. 17, 1996, Pat. No. 5,852,130. This application Sep. 15, 1998, Appl. No. 154,402. Claims priority, application France, Jun. 16, 1995, 95 07328

Int. Cl.[7] **B01J** *31/00;* **C07C** *5/10;5/05;5/02;5/03*

U.S. Cl. 502—164 **23 Claims**

1. A non-aqueous catalytic composition comprising a non-aqueous solvent which is ionic in nature and liquid at a temperature below 150° C. wherein said solvent comprises:

at least one quaternary ammonium and/or phosphonium salt with formula QA, where Q represents a quaternary ammonium and/or phosphonium cation, and A represents a tetrafluoroborate, tetrachloroborate, hexafluorophosphate, trifluoromethylsulphonate, fluorosulphonate, trichlorozincate, trichlorocuprate or tetrachlorocuprate anion; and

at least one complex of a transition metal from groups 8, 9 or 10 in a concentration of 1–500 mmoles per liter of said at least one quaternary ammonium and/or phosphonium salt.

6,040,264

USE OF ALKALINE EARTH METAL CONTAINING SMALL PORE NON-ZEOLITIC MOLECULAR SIEVE CATALYSTS IN OXYGENATE CONVERSION

Hsiang-Ning Sun, Houston, and Stephen Neil Vaughn, Kingwood, both of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Filed Apr. 4, 1996, Appl. No. 627,522

Int. Cl.[7] **B01J** *27/182;21/08;* **C07C** *1/00;* **C01B** *15/16*

U.S. Cl. 502—214 **17 Claims**

1. A method for converting an oxygenate to an olefin comprising contacting said oxygenates with a non-zeolitic molecular sieve catalyst under effective conditions to produce said olefin, wherein said non-zeolitic molecular sieve has a pore diameter size of about 5 Angstroms or less and has been prepared in-situ or modified after molecular sieve synthesis by incorporation of an alkaline earth metal selected from the group consisting of strontium, calcium, barium, and mixtures thereof, using an alkaline earth metal ion containing compound, wherein the alkaline earth metal ion in said alkaline earth metal ion containing compound is selected from the group consisting of strontium, calcium, barium, and mixtures thereof.

6,040,265

METHODS OF MAKING HIGHLY DISPERSED SUBSTANTIALLY UNIFORM CERIUM AND ZIRCONIUM MIXED-METAL-OXIDE COMPOSITE SUPPORTS FOR EXHAUST CONVERSION CATALYSTS

John G. Nunan, Tulsa, Okla., assignor to Asec Manufacturing General Partnership, Catoosa, Okla.

Continuation-in-part of application No. 08/802,723, Feb. 20, 1997, Provisional application No. 60/012,007, Feb. 21, 1996. This application Sep. 10, 1998, Appl. No. 150,875.

Int. Cl.[7] **B01J** *21/00;23/00*

U.S. Cl. 502—242 **2 Claims**

1. A method of preparing a promoted catalyst support effective in enhancing the performance of catalytically active metals in the conversion of exhaust gas from internal combustion engines, comprising:

a. Impregnating a suitable refractory oxide support material with a solution of a primary metal acetate and at least one secondary metal acetate, said primary metal acetate selected from the group consisting of acetates of Ce and Zr that produce, when in admixture with said at least one secondary metal acetate, mixed-metal oxides after calcination, and an organic depositing reagent selected from the group consisting of soluble sugars, saccharides, polysaccharides, or derivations thereof, and polyols that upon drying forms a matrix in which said primary and secondary metal acetates remain intimately and uniformly mixed, thereby forming an impregnated support material and, thereafter,

b. Drying and calcining the impregnated support material thereby producing a support having dispersed thereon a substantially homogeneous composition of mixed-metal-oxide crystallites, said composition containing less than about 10 wt. % single-metal-oxide crystallites, uniformly dispersed on a refractory-oxide-support.

6,040,266

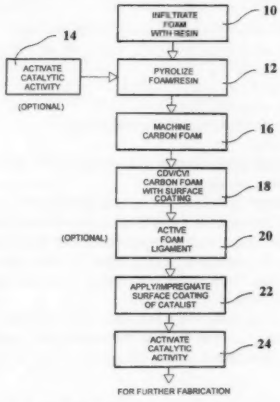
FOAM CATALYST SUPPORT FOR EXHAUST PURIFICATION

Thomas F. Fay, III, Fair Oaks; Raffaele La Ferla, Hermosa Beach; Andrew J. Sherman, Granada Hills, and Edwin P. Stankiewicz, Sherman Oaks, all of Calif., assignors to Ultramet, Pacoima, Calif.

Filed Feb. 22, 1994, Appl. No. 199,684

Int. Cl.[7] **B01J** *21/04;21/18*

U.S. Cl. 502—439 **29 Claims**



1. A method of producing an acoustic baffle/catalyst foam support material including the following steps:

providing a polyurethane open cell foam material having a pore density between ten and 100 pores per inch,

providing a resin material,

infiltrating the polyurethane foam with the resin material to produce an impregnated foam,

pyrolizing the impregnated foam to form a carbon foam skeleton, and

coating the carbon foam skeleton with one or more of the following group of materials without blocking said pores to produce a coated foam support comprising five to thirty five percent solid compared to sixty five to ninety five percent voids, the group of materials being SiC, Si_3N_4, $MoSi_2$ or metal which withstands temperatures in excess of 900° C., and

applying a catalyst to the coated carbon foam skeleton without blocking said pores, and wherein such catalyst is a metal or metals from the platinum group, and

recovering said acoustic baffle/catalyst foam support material, said acoustic baffle/catalyst foam support material having a through-flow configuration.

16. An acoustic baffle/catalyst support including:

an open cell carbon foam skeleton,

a surface coating on the carbon foam skeleton forming a support comprising five to thirty five percent solid compared to sixty five to ninety five percent voids,

wherein the surface coating is formed by one or more of the following group of materials SiC, Si_3N_4, $MoSi_2$ or metal which withstands temperatures in excess of 900° C., and

a catalytic layer on the surface coating and wherein such catalytic layer is formed from a platinum group metal or metals, said acoustic baffle/catalyst support having opposed sides and being adapted to permit fluid to flow through said voids from one of said opposed sides to the other.

6,040,267

IMAGE FORMING METHOD

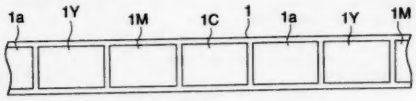
Shigeru Mano; Hiroshi Watanabe; Kaori Fukumuro, and Yorihiro Yamaya, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 11, 1998, Appl. No. 21,996

Claims priority, application Japan, Feb. 13, 1997, 9-028934; Jun. 17, 1997, 9-159869

Int. Cl.[7] B41M *5/035;5/28;5/38*

U.S. Cl. 503—201 **11 Claims**



1. An image forming method comprising the steps of:

superposing an image-receiving layer of an image-receiving element comprising

a support and

the image-receiving layer,

on an ink layer of an ink sheet comprising

a support and

an ink layer containing a dye chelatable with a metal ion-containing compound,

imagewise-heating the ink sheet by a heating device so that the dye of the ink layer is transferred to the image-receiving layer to form an image on the image-receiving layer, then

superposing the image-receiving layer in which the image has been formed on a sheet containing a metal ion-containing compound, and

heating the sheet containing the metal ion-containing compound by a heating device so that the metal ion-containing compound is transferred to the image-receiving layer having the image.

6,040,268

TRANSFER SHEET FOR ADHESIVE LAYER AND USE THEREOF

Takeshi Ueno; Tatsuya Kita, and Naoji Shibasaki, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

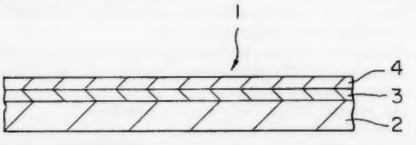
PCT No. PCT/JP96/00886, § 371 Date Nov. 14, 1996, § 102(e) Date Nov. 14, 1996, PCT Pub. No. WO96/31355, PCT Pub. Date Oct. 10, 1996

PCT Filed Apr. 1, 1996, Appl. No. 682,611

Claims priority, application Japan, Apr. 6, 1995, 7-106898; Apr. 6, 1995, 7-106899; Apr. 6, 1995, 7-106900; Apr. 6, 1995, 7-106901

Int. Cl.[7] B41M *5/035;5/38*

U.S. Cl. 503—227 **6 Claims**



1. A transfer sheet for an adhesive layer, comprising: a substrate sheet; and an adhesive layer and an interposing layer formed in this order on at least part of one surface of the substrate sheet, the substrate sheet and the adhesive layer being separable from each other, wherein said interposing layer has a glass transition point of from 50° to 115° C. and said adhesive layer has a glass transition point of from 35° to 100° C. the glass transition point of said interposing layer being above that of said adhesive layer.

6,040,269

METHOD FOR FORMING IMAGE ON OBJECT AND THERMAL TRANSFER SHEET AND THERMAL TRANSFER IMAGE-RECEIVING SHEET FOR USE IN SAID METHOD

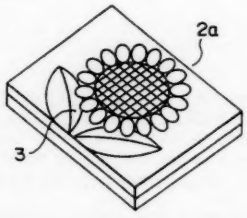
Kazunobu Imoto; Katsuyuki Oshima, and Hideki Nishikawa, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Division of application No. 08/406,138, Mar. 20, 1995, Pat. No. 5,741,754. This application Jan. 21, 1998, Appl. No. 9,944.

Claims priority, application Japan, Mar. 18, 1994, 6-72962; Mar. 18, 1994, 6-72963

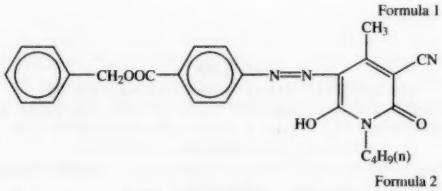
Int. Cl.[7] B41M *5/035;5/38*

U.S. Cl. 503—227 **4 Claims**

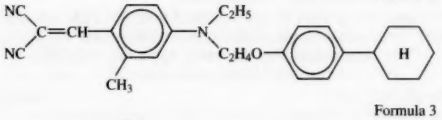


1. A thermal transfer sheet for forming an image on an object, comprising a support and, provided thereon, at least a yellow dye-holding layer, a magenta dye-holding layer, and a cyan dye-holding layer, said dye-holding layers each comprising a thermal transfer dye and a binder resin, said yellow dye-holding layer comprising as the thermal transfer dye a dye represented by the following formula 1 and/or a dye represented by the following formula 2, said magenta dye-holding layer comprising as the thermal transfer dye a dye represented by the following formula 3 and at least one dye selected from those represented by the following formulae 4 and 5, said cyan dye-holding layer comprising as the thermal transfer dye a dye represented by the following formula 6:

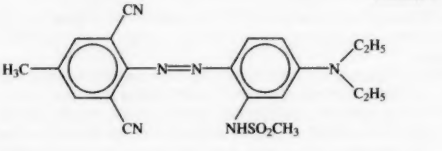
Formula 1



Formula 2



Formula 3



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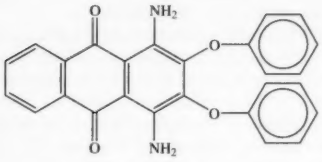
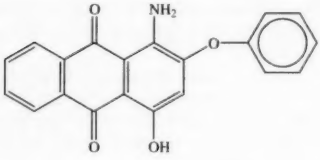
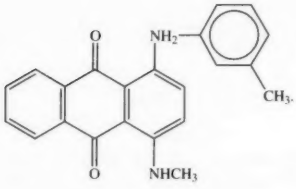
Formula 4



Formula 5



Formula 6



6,040,270

HERBICIDAL COMPOSITION

Nobuaki Mito, Kobe, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

PCT No. PCT/JP98/00578, § 371 Date Mar. 24, 1999, § 102(e) Date Mar. 24, 1999, PCT Pub. No. WO98/35558, PCT Pub. Date Aug. 20, 1998

PCT Filed Feb. 13, 1998, Appl. No. 147,960

Claims priority, application Japan, Feb. 17, 1997, 9-032398; Feb. 17, 1997, 9-032399; Feb. 17, 1997, 9-032400; Feb. 17, 1997, 9-032405

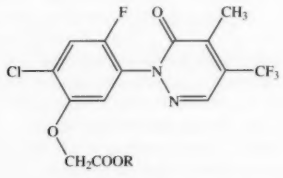
Int. Cl.[7] A01N *43/58;57/02*

U.S. Cl. 504—128 **51 Claims**

1. A herbicidal composition for foliar treatment comprising as active ingredients,

(a) a compound of the general formula:

[1]



wherein R is C_1–C_7 alkyl, C_5–C_6 cycloalkyl, C_2–C_6 alkenyl, dimethylamino, or diethylamino; and

(b) N-(phosphonomethyl)glycine (glyphosate) or a salt thereof, or ammonium DL-homoalanin-4-yl(methyl)phosphinate (glufosinate-ammonium).

6,040,271

SELECTIVE HERBICIDES FOR THE CULTIVATION OF SUGAR CANE

Wolfgang Thielert, Bury St. Edmunds, United Kingdom; Gerhard Bohne, Langenfeld, and Klaus-Helmut Müller, Düsseldorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 20, 1998, Appl. No. 26,857

Int. Cl.[7] A01N *43/653;43/70;47/30*

U.S. Cl. 504—134 **4 Claims**

1. Herbicidal compositions comprising an active compound combination of 4-amino-5-isopropyl- 2-(tert-butylaminocarbonyl)-2,4-dihydro-3H-1,2,4-triazol-3-one and one or more compounds selected from the group consisting of ametryn and diuron.

6,040,272

AQUEOUS GLYPHOSATE/SURFACTANT COMPOSITIONS FOR BASAL AND DORMANT STEM BRUSH CONTROL

Domingo C. Riego, Carmel, Ind.; Kenneth C. Cox, McHenry; Franklin E. Sexton, Richmond, both of Ill., and James C. Meadows, Fernandina Beach, Fla., assignors to Monsanto Company, St. Louis, Mo.

Provisional application No. 60/038,020, Feb. 14, 1997. This application Feb. 12, 1998, Appl. No. 22,599.

Int. Cl.[7] A01N *57/00;39/02;37/10;43/48;43/40*

U.S. Cl. 504—206 **21 Claims**

1. An aqueous herbicidal composition useful for controlling woody plants when applied to bark, comprising:

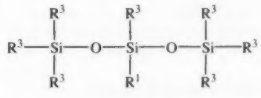
a) water, having dissolved or dispersed therein:

b) a herbicidally effective amount of a water-soluble herbicide; and

c) about 10% to about 90% by weight of a surfactant composition that comprises:

i) about 5% to about 35% by weight of one or more polyoxyalkylene trisiloxane surfactant(s) having a structure corresponding to formula (I):

(I)



where R^1 is $—C_nH_{2n}O(CH_2CH_2O)_a(CH_2CH(CH_3)O)_bR^2$, in which n is 1 to 6, a is 1 to about 30, b is 0 to about 3 and R is hydrogen or a C_{1-4} hydrocarbyl or C_{2-4} acyl group, and where R^3 groups are independently C_{1-4} hydrocarbyl groups; and

ii) about 50% to about 95% by weight of one or more glycols or glycol ethers having a structure corresponding to formula (II):

$$HO—(R^4—O)_x—R^5 \quad (II)$$

where R^4 groups are independently linear or branched C_{2-6} alkylene groups, x is 1 to about 4 and R^5 is hydrogen or a C_{1-4} hydrocarbyl group.

6,040,273

DIFORMYLUREA AND REACTION PRODUCTS OF UREA AND CARBOXYLIC ACIDS

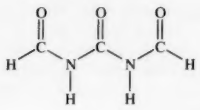
Frank William Dean, Spring, Tex., assignor to Stoller Enterprises, Inc., Houston, Tex.

Filed Apr. 9, 1997, Appl. No. 831,799

Int. Cl.[7] A01N *47/34*

U.S. Cl. 504—328 **14 Claims**

1. A composition of matter comprising diformylurea having the formula



6,040,274

2-AROYLCYCLOHEXANEDIONES, THEIR PREPARATION AND THEIR USE AS HERBICIDES OR PLANT GROWTH-REGULATING AGENTS

Jürgen Kast, Böhl-Iggelheim; Marcus Vossen, Mannheim; Wolfgang von Deyn, Neustadt; Stefan Engel, Wörrstadt; Regina Luise Hill, Speyer; Uwe Kardorff, Mannheim; Martina Otten, Ludwigshafen; Peter Plath, Frankenthal; Helmut Walter, Obrigheim; Karl-Otto Westphalen, Speyer, and Ulf Misslitz, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/03685, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO96/10561, PCT Pub. Date Apr. 11, 1996

PCT Filed Sep. 19, 1995, Appl. No. 809,100

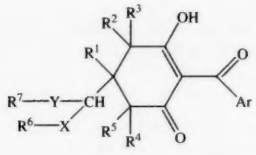
Claims priority, application Germany, Sep. 30, 1994, 44 34 987

Int. Cl.[7] **A01N** *31/04*

U.S. Cl. 504—348 **12 Claims**

1. A 2-aroylcyclohexanedione of the formula I

(I)



where the variables have the following meanings:

R^1 is hydrogen;

R^2, R^3 and R^4 independently of one another are hydrogen or C_1–C_4-alkyl;

R^5 is hydrogen, C_1–C_4-alkyl or (C_1–C_4-alkoxy)carbonyl;

R^6 and R^7 independently of one another are C_1–C_4-alkyl, benzyl or together are an ethylene or propylene chain, where each methylene unit may carry one or two C_1–C_4-alkyl radicals;

X and Y are oxygen;

Ar is phenyl, which carries from one to four substituents selected from the group consisting of halogen cyano, nitro, —N=N—Ph, (C_1–C_4-alkoxy)carbonyl, —N(R^9)—COR^{10}, —N(R^9)—SO_2—R^{11}, —SO_2—N(R^9)R^{10}, —S(O)$_m$—R^8, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl and C_1–C_4-haloalkoxy, where the four last-mentioned radicals in turn may carry one or two of the following substituents: C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or cyano;

Ph is phenyl which may carry one to three substituents selected from the group consisting of halogen, cyano, nitro, —S(O)$_n$—R^{23}, (C_1–C_4-alkoxy)carbonyl, —SO_2—N(R^{24})R^{25}, —N(R^{24})—COR^{25}, —N(R^{24})—SO_2R^{26}, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl and C_1–C_4-haloalkoxy, where the four last-mentioned radicals in turn may carry one or two of the following substituents: C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or cyano;

m and n independently of one another are 0, 1 or 2;

R^8 and R^{23} independently of one another are C_1–C_4-alkyl or C_1–C_4-haloalkyl, which both may carry one or two C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or cyano radicals;

R^9, R^{10}, R^{24} and R^{25} independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl or phenyl, which may carry one to three halogen, C_1–C_4-alkyl, and/or C_1–C_4-alkoxy radicals;

R^{11} and R^{26} independently of one another are C_1–C_4-alkyl or C_1–C_4-haloalkyl, both may carry one or two cyano, phenyl and/ or benzyl radicals;

or an agriculturally utilizable salt of I or an ester of I with a C_1–C_{10}-carboxylic, sulfonic or phosphonic acid or inorganic acid.

7. A method of controlling undesired plant growth, which comprises allowing a herbicidally active amount of a 2-aroylcyclohexanedione of the formula I or an agriculturally utilizable salt or an ester of I, as defined in claim **1**, to act on plants, their habitat or on seed.

6,040,275

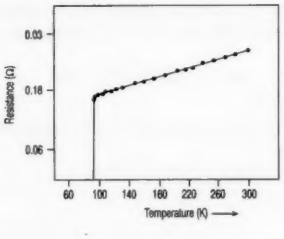
PREPARATION OF SUPERCONDUCTING FILMS AND A PROCESS FOR PREPARING THE FILMS

Jacob Koshy; Jijimon Kumpukkattu Thomas; Jose Kurian; Yogendra Prasad Yadava, and Alathoor Damodaran Damodaran, all of Trivandrum, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Division of application No. 08/924,662, Sep. 5, 1997, Pat. No. 5,856,276, which is a continuation of application No. 08/506,885, Aug. 14, 1995, abandoned, which is a continuation of application No. 08/221,154, Mar. 31, 1994, abandoned. This application Aug. 3, 1998, Appl. No. 127,828.

Int. Cl.[7] **A01L** *39/24;* **B05D** *5/12*

U.S. Cl. 505—471 **17 Claims**



1. A process for the preparation of a ceramic substrate of the formula $REBa_2MO_6$ where RE represents rare earth metals and M represents metals Nb, Sb, Sn, Hf, and Zr, which process comprises:

(i) reacting salts of rare earth metals, barium, and a metal selected from the group consisting of Nb, Sn, Sb, Hf, and Zr in an organic medium to form a mixture,

(ii) forming pellets of the resultant mixture,

(iii) calcining the pellets to form a homogenous mixture;

(iv) grinding the calcined material;

(vi) sintering the resultant product; and

(vii) allowing the resultant product to cool to room temperature to obtain the ceramic substrate.

6,040,276

PROCESS AND WATER-BASE FLUID UTILIZING HYDROPHOBICALLY MODIFIED CELLULOSE DERIVATIVES AS FILTRATE REDUCERS

Annie Audibert, Le Vesinet; Jean-Francois Argillier, Suresnes, both of France; Louise Bailey, Comberton Cambridge, and Paul I. Reid, Cambridgeshire, both of United Kingdom, assignors to Institut Francais Du Petrole, France

Division of application No. 08/673,478, Jul. 1, 1996, Pat. No. 5,669,456. This application Mar. 5, 1997, Appl. No. 812,334.

Claims priority, application France, Mar. 3, 1994, 94 02572

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C09K *3/00;* **E21B** *43/25*

U.S. Cl. 507—214 **18 Claims**

1. In a water-base drilling, well completion or well workover fluid, the improvement wherein the fluid contains a predetermined amount of at least one water soluble cellulose derivative hydrophobically modified by a hydrophobic alkyl radical having between 8 to 18 carbon atoms, and between 0.5 and 10 g/l of HM HEC, between 2 and 4 g/l of viscosifying polymer, between 10 and 100 g/l of KCl or NaCl and between 0 and 30 g/l of reactive clay.

6,040,277

GREASE COMPOSITIONS EMPLOYING FLUORINATED POLYMER OILS AND HEXAGONAL LATTICE BORON NITRIDE

Gerardo Caporiccio, Milan, Italy, assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 8, 1994, Appl. No. 207,512

Claims priority, application Italy, Sep. 13, 1993, MI93A1965

Int. Cl.[7] C10M *125/26*

U.S. Cl. 508—155 **11 Claims**

1. A grease composition comprising:

(A) between 5 and 45 weight percent of a thickening agent comprising boron nitride powder having a bimodal particle size distribution in which between 25 and 75 weight percent of the boron nitride has an average particle size in the range of from 2 to 50 micrometers and between 75 and 25 weight percent of the boron nitride has an average particle size in the range of from 0.01 to 1 micrometer; and

(b) between 55 and 95 weight percent of a liquid fluorinated polymer oil.

6,040,278

WATER-FREE RELEASE/LUBRICATION AGENT FOR TREATING THE WALLS OF A DIE FOR ORIGINAL SHAPING OR RESHAPING

Douwe Marten Kok, Scheemda, and Harold Gankema, Groningen, both of Netherlands, assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed Sep. 23, 1998, Appl. No. 159,199

Claims priority, application Germany, Mar. 9, 1998, 198 10 031

Int. Cl.[7] C10M *111/04*

U.S. Cl. 508—208 **13 Claims**

1. Water-free composition for treating the walls of a die for original shaping or reshaping, comprising in weight percent, about 7% to 30% of at least one wax material selected from the group consisting of polyethylene, polybutene, polypropylene, and ethylene-propylene copolymer, and at least 70% to about 93% of a silicone oil selected from a least one of the group consisting of silicone oil, vegetable oil, and mineral oil.

6,040,279

LUBRICANT COMPOSITION SUITABLE FOR DIRECT FUEL INJECTED, CRANKCASE-SCAVENGED TWO-STROKE CYCLE ENGINES

Sumanth Addagarla, Richmond, and Glenn E. Callis, Walnut Creek, both of Calif., assignors to Chevron Chemical Company LLC, San Francisco, Calif.

Division of application No. 08/790,558, Nov. 25, 1996, Pat. No. 5,866,520, Provisional application No. 60/010,936, Jan. 31, 1996. This application Jun. 24, 1998, Appl. No. 104,075.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C10M *129/68*

U.S. Cl. 508—437 **6 Claims**

1. A lubricant composition suitable for direct fuel injected, crankcase-scavenged two-stroke cycle engines comprising:

(a) a major amount of at least one oil of lubricating viscosity;

(b) a minor amount of an additive comprising:

(1) an esterified polyalcohol, and

(2) an aliphatic aromatic amine-phosphate; and

(c) a minor amount of a polyisobutylene having a number average molecular weight of from 400 to 2,500, wherein the amount of polyisobutylene is no more than 10 weight %.

6,040,280

LUBRICANT AND SURFACE CONDITIONER SUITABLE FOR CONVERSION COATED METAL SURFACES

Timm L. Kelly, Birmingham, and Gary L. Rochfort, Shelby Township, both of Mich., assignors to Henkel Corporation, Gulph Mills, Pa.

PCT No. PCT/US96/18554, § 371 Date Jun. 1, 1998, § 102(e) Date Jun. 1, 1998, PCT Pub. No. WO97/20903, PCT Pub. Date Jun. 12, 1997

Provisional application No. 60/007,853, Dec. 1, 1995. This PCT application Nov. 27, 1996, Appl. No. 77,592.

Int. Cl.[7] C10M *173/02*

U.S. Cl. 508—503 **20 Claims**

1. A liquid concentrate suitable for mixing with water to produce a liquid lubricant and surface conditioner forming composition, said concentrate comprising water and:

(A) an amount of a component selected from the group consisting of molecules of oxa acids and their methyl esters corresponding to general formula (I):

$$CH_3(CH_2)_nO(CH_2CH_2O)_xCH_2C(O)OR \quad (I),$$

where each of n and x, which may be the same or different, is a positive integer, x is not less than 8, and R represents H or CH_3; and

(B) an amount of a component selected from the group consisting of:

(B.1) molecules corresponding to general formula (I) when x is not more than 7;

(B.2) molecules conforming to general formula (II):

$$R^1O(CH_2CH_2O)_y(CH_2CHCH_3O)_zH \quad (II),$$

where R^1 is a moiety selected from the group consisting of (i) saturated and unsaturated straight and branched chain aliphatic monovalent hydrocarbon moieties and (ii) saturated and unsaturated straight and branched chain aliphatic monovalent hydrocarbon moiety substituent bearing phenyl moieties in which the aromatic ring in the phenyl moiety is directly bonded to the oxygen atom appearing immediately after the R^1 symbol in formula (II); y is a positive integer, and z is zero, one, or two;

(B.3) molecules conforming to general formula (III):

$$R^2C(O)O(CH_2CH_2O)_pH \quad (III),$$

where R^2 is selected from the group consisting of saturated and unsaturated straight and branched chain aliphatic monovalent hydrocarbon moieties and p is a positive integer;

(B.4) molecules conforming to general formula (IV):

$$HO(CH_2CH_2O)_q(CH_2CHCH_3O)_r(CH_2CH_2O)_{q'}H \quad (IV),$$

where each of q and q', which may be the same or different, represents a positive integer from 2 to 10 and r represents a positive integer from 3 to 60; and

(B.5) molecules conforming to general formula (V):

$$HO(CH_2CHCH_3O)_s(CH_2CH_2O)_t(CH_2CHCH_3O)_{s'}H \quad (V),$$

where each of s and s', which may be the same or different, represents a positive integer from 10 to 63 and t represents a positive integer from 2 to 20,

wherein the amount of component (B) has a ratio to the amount of component (A) that is from about 0.2: 1.0 to about 10:1.0.

6,040,281

USE ALKALI AND/OR TRIETHANOLAMINE SALTS OF THE ALKANOYLAMIDOCARBOXYLIC ACIDS IN METAL WORKING

Heinz Bereuter; Thomas Bereuter, both of Hard; Wolfgang Bereuter, Salzburg, and Ingrid Kohlhaupt, Hard, all of Austria, assignors to Heinz Bereuter, Australia

PCT No. PCT/EP96/05837, § 371 Date Jul. 5, 1998, § 102(e) Date Jul. 5, 1998, PCT Pub. No. WO97/25394, PCT Pub. Date Jul. 17, 1997

PCT Filed Dec. 24, 1996, Appl. No. 101,253

Claims priority, application Austria, Jan. 4, 1996, 10/96

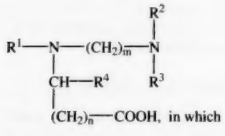
Int. Cl.[7] C10M *133/06*

U.S. Cl. 508—508 **6 Claims**

1. A method to reduce foaming of corrosion-inhibiting metal working compositions, comprising the steps of

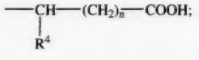
selecting at least one of alkali metal salts and triethanolamine salts of alkanoylamidocarboxylic acids of a general formula

(A)

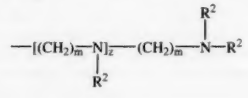


R^1 denoted an alkanoyl or an alkanesulfonyl radical, each having 6 to 20 carbon atoms,

R^2 denotes the radical



R^3 denotes the radical $—R^2$ or



R^4 denotes a hydrogen atom;

m is 2

n is 0 or 1

z denotes an integer form 0 to 3, and

adding an amount of at least 5 percent by weight to a concentrate of said corrosion-inhibiting metal working compositions in aqueous solution, as antifoams.

6,040,282

STYLING SHAMPOO COMPOSITIONS WHICH DELIVER IMPROVED HAIR CURL RETENTION AND HAIR FEEL

Susan Marie Guskey, Montgomery; Everett Junior Inman, Cincinnati; Teresa Ann Desch, Loveland; Lynne Anne Fritschi, and Stephanie Lynn Killion, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of application No. 09/017,597, Feb. 3, 1998, abandoned. This application Jan. 25, 1999, Appl. No. 237,272.

Int. Cl.[7] C11D *1/65;3/37;9/36*

U.S. Cl. 510—119 **25 Claims**

1. A styling shampoo composition comprising:

(a) from about 5% to about 50% by weight of a detersive surfactant selected from the group consisting of anionic surfactants, zwitterionic and amphoteric surfactants, and combinations thereof;

(b) from about 0.025% to about 3% by weight of an organic cationic deposition polymer which has a cationic charge density of from about 0.2 meq/gm to about 7 meq/gm and an average molecular weight of from about 5,000 to about 10 million;

(c) from about 0.1% to about 10% by weight of a water-insoluble hair styling polymer;

(d) from about 0.1% to about 10% by weight of a volatile, water-insoluble carrier for the hair styling polymer;

(e) from about 0.005% to about 2.0% by weight of a crystalline hydroxyl-containing stabilizing agent; and

(f) from about 22% to about 94.3% by weight water;

wherein the composition is characterized by having a Hair Feel Index (HFI)≧0.65 and a Curl Retention Value (CRV)≧70.

6,040,283

CONCENTRATED ALKALINE GLUTARALDEHYDE-PHENOLIC DISINFECTANT

Norman A. Miner, Fort Worth, Tex., assignor to Microchem Laboratory, Inc., Fort Worth, Tex.

Filed Jul. 8, 1998, Appl. No. 112,162

Int. Cl.[7] C11D *3/48;3/30*

U.S. Cl. 510—161 **9 Claims**

1. A high level disinfectant and sterilant solution useful to disinfect and sterilize heat-sensitive medical, dental and veterinary devices, comprising a two-part system for mixing just prior to use, wherein the two-part system comprises:

(a) as a first part a concentrate of from about 10.0% w/w to 25.0% w/w of glutaraldehyde, and a phenolic chemical at a concentration of 0.5% w/w to 2.2% w/w, to provide a pH of about 3.5 to 4.5; and

(b) as a second and separate contained part an activated buffer form of EDTA, at a sufficient level to give the final disinfectant a buffered pH of between 7.0 and 8.5.

6,040,284

PAINT COATINGS REMOVER COMPRISING PROPYLENE CARBONATE AND HYDROGEN PEROXIDE

Edward T. Marquis, Austin, and Robert E. Baldwin, Georgetown, both of Tex., assignors to Huntsman Petrochemical Corporation, Austin, Tex.

Provisional application No. 60/047,529, May 23, 1997, Provisional application No. 60/048,450, Jun. 3, 1997. This application May 22, 1998, Appl. No. 83,402.

Int. Cl.[7] C11D *3/39;3/43*

U.S. Cl. 510—201 **21 Claims**

1. A composition useful as a paint remover, comprising: propylene carbonate, hydrogen peroxide, and water, wherein the amount of propylene carbonate is more than 50 percent by weight of the composition.

6,040,285
COMPOSITION FOR STRIPPING PAINTS, VARNISHES OR LACQUERS

Jean-Pierre Lallier, Courbevoie; Patrick Marie, Houilles; Jean-Marie Aubry, Oignies; Marie-José Marti, Templeuve, and Valérie Del Nero, Lille, all of France, assignors to Elf Atochem, S.A., France

Filed Dec. 8, 1997, Appl. No. 986,407
Claims priority, application France, Dec. 6, 1996, 96 15040
Int. Cl.[7] **C09D** *9/00;9/04;* **C11D** *9/04;7/52*
U.S. Cl. 510—206 **14 Claims**

1. A composition for stripping paints, varnishes or lacquers from a substrate, comprising:

(A) a mixture of (A1) at least one aromatic solvent selected from the group consisting of benzaldehyde and anisole, and of (A2) benzoic acid;

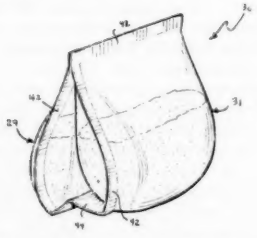
(B) 99 to 30 parts by weight of water;

(A)+(B) equals in total 100 parts by weight.

6,040,286
THROUGH-THE-WASHER-DRYER POUCH-TYPE DETERGENT BAG AND METHOD OF USE

Karen L. Huff, 8215 Orchard Ave. #6, La Mesa, Calif. 91941

Filed Dec. 26, 1995, Appl. No. 910,548
Int. Cl.[7] **C11D** *17/04;* **B08B** *3/00*
U.S. Cl. 510—297 **6 Claims**



1. A through-the-washer-dryer detergent bag comprising;

a pair of containers each having an inner panel and an outer panel; each of said panels being made of air and water permeable material and each of said panels having a left edge, a right edge, a top edge and a bottom edge; said respective top edges and left edges of said respective sets of inner and outer panels being sealed together adjacent their respective edges to form two containers each having an interior chamber therein having a total volume V_T; said chambers each having a length **L2**, a height **H5**, and a width **W2**; **L2** is in the range of 2.5"–6", **H5** is in the range of 2.5"–6", and **W2** is in the range of 0.5"–2.5"; a granular detergent particulate in each of said chambers; the size of said detergent particulate being in the range of 5–250 microns and the total weight of said detergent particulate being in the range of 1–8 ounces; the volume of said particulate being in the range of 0.40 V_T–0.70 V_T, and the remaining air volume in each of said containers having a volume in the range of 0.30 V_T–0.60 V_T; and

the top edges of said respective containers being sealed together and a web of material having a top surface and a bottom surface connects the respective bottom edges of said respective containers together thus forming an air and water passageway between the inner panels of said respective containers and said top surface of said web of material.

6. A method of providing cleaning, fabric-softening and anti-static properties to clothes which comprises:

(a) picking up a detergent bag having the following structure:

a front panel having a left edge, a right edge, a top edge and a bottom edge; said front panel being made of air and water permeable material;

a rear panel having a left edge, a right edge, a top edge and a bottom edge; said rear panel being made of air and water permeable material;

said respective left edges, right edges and top edges of said front and rear panels being sealed together adjacent their respective edges to form a container having an interior chamber therein having a total volume V_T; said chamber having a length **L1**, a height **H1** and a width **W1**; **L1** is in the range of 2.51"–6", **H1** is in the range of 2.5"–6', and **W1** is in the range of 0.5"–2.5"; said front and rear panels are impregnated with a fabric softener/anti-static ingredients; and

a granular detergent particulate in said chamber; the size of said particulate being in the range of 5–250 microns and the total weight of said detergent particulate being in the range of 1–8 ounces; the volume of said detergent particulate being in the range of 0.40 V_T–0.70 V_T, and the remaining air volume of said chamber having a volume in the range of 0.30 V_T–0.60 V_T.

(b) dropping said detergent bag into a clothes washing machine set to a wash cycle and as said bag comes into contact with water in said clothes washing machine, said bag puffs up;

(c) agitating said detergent bag in the water during a wash cycle in said clothes washing machine causing water to permeate the interior chamber of said bag and dissolve said detergent and said dissolved detergent and air is then forced out of said chamber as said chamber collapses and said bag becomes flattened;

(d) continued agitation of said detergent bag in said washing machine causes said bag to curl up into a wad of material; and

(e) transferring clothes that have finished a wash cycle along with said bag in its wadded state into a clothes dryer that heats up the wadded bag sufficiently to release its fabric softener/anti-static ingredients.

6,040,287
LAUNDRY CONCENTRATES

Andrea Lee Motyka, Doylestown, Pa.; Guy Broaze, Garce-Hollogne, Belgium, and Alison Kugler, South River, N.J., assignors to Colgate-Palmolive Co, New York, N.Y.

Division of application No. 08/679,747, Jul. 15, 1996, Pat. No. 5,856,287, which is a continuation of application No. 08/396,858, Mar. 1, 1995, abandoned. This application Jan. 22, 1998, Appl. No. 153,809.
Int. Cl.[7] **C11D** *10/02*
U.S. Cl. 510—340 **3 Claims**

1. A fabric softener concentrate composition in the form of a water-in-oil emulsion containing at least about 2% by weight water and comprising a mixture of at least one non-ionic surfactant and at least one water insoluble oil containing a polar proton sharing group and having a melting point below about 30° C., said non-ionic surfactant being the condensation product of an aliphatic alcohol having from about 6 to 26 carbon atoms with ethylene oxide, said oil being selected from the group consisting of saturated aliphatic alcohols or acids containing from about 6 to 12 carbon atoms and unsaturated liquid fatty C_{16} to C_{18} acids or alcohols, said fabric softener concentrate containing from about 1 to about 25% by weight of a cationic or nonionic fabric softener compound, said concentrate characterized by a viscosity of at least about 10 cps and further characterized that, upon dilution with at least about one volume of water per volume of concentrate, the concentrate is at least partially converted into a liquid crystal phase dispersion providing a diluted concentrate having a viscosity of at least about 50 cps.

6,040,288

FABRIC COLOR PROTECTION COMPOSITIONS AND METHODS

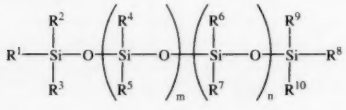
Christine Popoff, Morganville; Alwyn Nartey, Plainsboro; Robert Gabriel, Cranbury, all of N.J., and Eric Aubay, Courbevoie, France, assignors to Rhodia Inc., Cranbury, N.J.

Provisional application No. 60/038,299, Feb. 21, 1997, Provisional application No. 60/074,393, Feb. 11, 1998. This application Feb. 20, 1998, Appl. No. 26,828.

Int. Cl.[7] **C11D** *3/04;3/16*

U.S. Cl. 510—466 **47 Claims**

1. A method comprising washing a colored fabric article in a washing medium comprised of a major amount by weight of water, a first minor amount by weight of a detergent and a second minor amount by weight of an aminosilicone compound having the formula:



wherein:

R^1 and R^8 are independently selected from the group consisting of hydrogen, hydroxyl, alkyl and alkoxy,

R^2, R^3, R^9, and R^{10} are independently selected from the group consisting of alkyl, and alkoxy, provided that one of R^2, R^3, R^9, and R^{10} may be selected from the group consisting of a primary amino-substituted alkyl group, a secondary amino-substituted alkyl group and an N-(amino-alkyl)-substituted aminoalkyl group having both primary and secondary amine functionality,

R^4, R^5, and R^6 are independently selected from the group consisting of alkyl and aryl, R^7 is selected from the group consisting of a primary amino-substituted alkyl group, a secondary amino-substituted alkyl group and an amino-alkyl-substituted alkyl group having both primary and secondary amine functionality, and

m and n are numbers wherein m is greater than n and the sum of n and m yield an aminosilicone compound with a viscosity of 10 to 100,000 cps at 25°,

wherein said first minor amount by weight is greater than said second minor amount by weight.

6,040,289

AMINO ACID DERIVATIVES, MEDICAMENTS CONTAINING SAID COMPOUNDS AND METHODS OF PRODUCING SAID COMPOUNDS

Wolfgang Eberlein; Wolfhard Engel; Klaus Rudolf, all of Biberach; Henri Doods, Warthausen; Heike-Andrea Wieland, Biberach, and Klaus-Dieter Willim, Hochdorf, all of Germany, assignors to Dr. Karl Thomae GmbH, Biberach, Germany

PCT No. PCT/EP96/05214, § 371 Date May 29, 1998, § 102(e) Date May 29, 1998, PCT Pub. No. WO97/19914, PCT Pub. Date Jun. 5, 1997

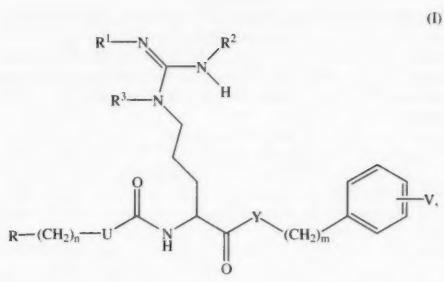
PCT Filed Nov. 26, 1996, Appl. No. 77,663

Claims priority, application Germany, Nov. 30, 1995, 195 44 686

Int. Cl.[7] **A61K** *38/00;* **A01N** *37/18*

U.S. Cl. 514—2 **7 Claims**

1. A compound of the formula



(I)

wherein

R denotes a phenyl, 1-naphthyl or 2-naphthyl, a 5-membered heteroaromatic ring linked via a carbon atom and containing a nitrogen, oxygen or sulphur atom or a nitrogen atom and an oxygen, a sulphur or further nitrogen atom, wherein a nitrogen atom of an imino group of said 5-membered heteroaromatic ring is optionally substituted by an alkyl, alkoxycarbonylalkyl, carboxyalkyl,. dialkylaminoalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl or· alkoxycarbonyl, or a 6-membered heteroaromatic ring linked via a carbon atom, containing 1, 2 or 3 nitrogen atoms, wherein a 1,4-butadienylene group is optionally attached both to the 5-membered or to the 6-membered heteroaromatic rings via two adjacent carbon atoms to form bicyclic heteroaromatic rings which are optionally bound via a carbon atom of the 1,4-butadienylene group,

wherein the groups mentioned for R hereinbefore, including the mono- and bicyclic heteroaromatic rings in their carbon skeleton, are optionally mono-, di- or at most trisubstituted by fluorine, chlorine,bromine, alkyl, cycloalkyl groups with 3 to 8 carbon atoms, alkoxy, phenyl, phenylalkoxy, trifluoromethyl, alkoxycarbonylalkyl, carboxyalkyl, dialkylaminoalkyl, hydroxy, amino, acetylamino, propionylamino, benzoyl, benzoylamino, benzoylmethylamino, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoyl, cyano, trifluoromethoxy, trifluoromethylthio, trifluoromet[]hylsulphynyl or trifluoromethylsulphonyl, wherein the substituents are identical or different and the ab)ovementioned benzoyl, benzoylamino and benzoylmethylamino groups are optionally substituted in the phenyl moiety by fluorine, chlorine, bromine, alkyl, trifluoromethyl, amino or acetylamino,

or R is a diphenylmethyl group, wherein

the phenyl groups independently of one another are optionally mono- or disubstituted by fluorine, chlorine, bromine, methyl, methoxy, hydroxycarbonylmethoxy, alkoxycarbonylmethoxy, hydroxy or trifluoromethyl, wherein the substituents in each case are identical or different;

n denotes the numbers 0, 1 or 2,

U denotes a single bond, a oxygen atom or an —NH— group,

R^1 denotes a branched or unbranched aliphatic alkylcarbonyl containing 2 to 5 carbon atoms optionally substituted in the alkyl moiety by an alkoxycarbonyl, phenylalkoxycarbonyl, phenyl or by a 5- or 6-membered heteroaromatic ring linked via a carbon atom or a benzoyl group wherein the phenyl moiety is optionally replaced by a 5- or 6-membered heteroaromatic ring linked via a carbon atom,

wherein the 5-membered heteroaromatic rings mentioned hereinbefore contain a nitrogen, an oxygen or sulphur atom or a nitrogen atom and an additional oxygen, sulphur or further nitrogen atom and are optionally substituted by an alkyl group at a nitrogen atom, the 6-membered heteroaromatic rings contain 1, 2 or 3 nitrogen atoms; wherein phenyl groups and 5- or 6-membered heteroaromatic rings in their carbon skeleton mentioned hereinbefore are optionally mono-, di- or trisubstituted by fluorine, chlorine, bromine, alkyl, cycloalkyl

groups with 3 to 8 carbon atoms, alkoxy, trifluoromethyl, alkoxycarbonylalkyl, carboxyalkyl, hydroxy, amino, acetylamino, propionylamino, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoyl, cyano, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulphynyl or trifluoromethylsulphonyl, wherein the substituents are identical or different, the aminocarbonyl group in this subparagraph is optionally mono- or disubstituted at the nitrogen atom by alkyl, phenylalkyl, (1-naphthyl)alkyl, (2-naphthyl)alkyl, alkoxycarbonylalkyl, phenylalkoxycarbonylalkyl, phenoxycarbonylalkyl, carboxyalkyl, diphenylalkyl, phenyl, cycloalkyl or cycloalkylalkyl groups with 3 to 8 carbon atoms in the ring in each case, the substituents are identical or different and the abovementioned phenyl groups are optionally independently, mono- or disubstituted by fluorine, chlorine, bromine, methyl, methoxy, hydroxycarbonylmethoxy, alkoxycarbonylmethoxy, hydroxy or trifluoromethyl;

or R^1 is an alkoxycarbonyl or phenylalkoxycarbonyl, wherein the phenyl moiety is optionally mono- or disubstituted by fluorine, chlorine, bromine, methyl, methoxy, hydroxycarbonylmethoxy, alkoxycarbonylmethoxy, hydroxy or trifluoromethyl wherein the substituents in each case are identical or different,

or R^1 is phenyl, a five-membered heteroaromatic ring bound via a carbon atom which contains a nitrogen, oxygen or sulphur atom or a nitrogen atom and an oxygen, sulphur or further nitrogen atom, wherein a nitrogen atom of an imino group of said five-membered heteroaromatic ring is optionally substituted by an alkyl, or a 6-membered heteroaromatic ring linked via a carbon atom, which contains 1, 2 or 3 nitrogen atoms, wherein the phenyl group and 5- and 6-membered heteroaromatic rings in their carbon skeleton are optionally mono-, di- or at most trisubstituted, by fluorine, chlorine, bromine, alkyl, cycloalkyl groups with 3 to 8 carbon atoms, phenylalkyl, alkoxy, trifluoromethyl, alkoxycarbonylalkyl, carboxyalkyl, hydroxy, amino, acetylamino, propionylamino, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoyl, cyano, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulphinyl or trifluoromethylsulphonyl and wherein the substituents are identical or different;

or, if R^2 denotes a hydrogen atom, R^1 is optionally methyl;

R^2 denotes a hydrogen atom, an alkyl or phenylalkyl optionally mono- or disubstituted in the phenyl moiety by fluorine, chlorine, bromine, alkyl, trifluoromethyl, amino or acetylamino, wherein the substltuents are identical or different;

R^3 denotes a hydrogen atom or an alkyl;

Y denotes an oxygen atom or $—NR^4—$ wherein

R^4 denotes a hydrogen atom, a branched or unbranched alkyl with 1 to 6 carbon atoms or a phenylmethyl group;

m denotes the number 1 or 2 and

V denotes a hydrogen atom, fluorine, chlorine, bromine, iodine, cyano, alkyl, hydroxy, alkoxy, phenylalkoxy-, alkylcarbonyl, dialkylamino, hydroxymethyl, hydroxyethyl, hydroxypropyl, hydroxybutyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio or the group $—(CH_2)_o—Y^1—W'Y^2$, wherein

o denotes the number 0, 1 or 2,

W denotes the $—SO_2—$ group or the group >C=X wherein

X denotes an oxygen atom or one of the divalent groups =N—$CONH_2$ or =N—CN,

Y1 denotes a single bond, an oxygen atom or $—NR^5—$ wherein

R^5 denotes a hydrogen atom or a straight-chained or branched alkyl with 1 to 6 carbon atoms or

R^5 together with the group Y^2, the enclosed nitrogen atom and the enclosed group >C=X forms a saturated heterocyclic ring with 5 to 7 ring members,

Y^2 denotes a straight-chained or branched alkyl with 1 to 10 carbon atoms optionally substituted by a hydroxy, alkoxycarbonyl, aminocarbonyl, a cycloalkyl group with 4 to 10 carbon atoms, a straight-chained or branched alkoxy with 1 to 5 carbon atoms, an aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, phenylmethoxy, 2-phenylethoxy, phenyl or phenylalkyl with 1 to 3 carbon atoms in the alkyl moiety optionally mono-, di- or trisubstituted in the phenyl moiety by fluorine, chlorine, bromine, methyl, trifluoromethyl, cyano, amino, hydroxy, methoxy, acetyl, acetylamino, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl, wherein the substituents are identical or different; or

Y2 is $—NR^6R^7$ wherein:

R^6 denotes a hydrogen atom, a straight-chained or branched alkyl with 1 to 6 carbon atoms optionally substituted by a hydroxy, carboxy, alkoxycarbonyl or dialkylamino with the proviso that the hydroxy is not bound in the 1-position of the alkyl, a cycloalkyl group with 4 to 8 carbon atoms, or R^6 is phenyl, phenylmethyl, 2-phenylethyl or 3-phenylpropyl optionally mono-, di- or trisubstituted in the phenyl moiety by fluorine, chlorine, bromine, methyl, trifluoromethyl, hydroxy, methoxy, amino, acetylamino, aminocarbonyl, methylaminocarbonyl, dimethylaminocarbonyl or cyano, wherein the substituents are identical or different, or R^6 is an alkanoyl, benzoyl, phenylalkanoyl, alkoxycarbonyl or aminocarbonyl; and

R^7 has the meanings given for R^6 with the exception of a phenyl, alkanoyl, benzoyl, phenylalkanoyl, alkoxycarbonyl or aminocarbonyl or

R^6 and R^7 together denote an n-alkylene group with 4 to 6 carbon atoms or

R^7 together with the group R^5 of the group $—NR^5—$ mentioned for Y^1 hereinbefore denotes an unbranched alkylene group or oxoalkylene group with 2 to 4 carbon atoms;

wherein all the abovementioned alkyl, cycloalkylalkyl, alkoxy, phenoxycarbonylalkyl, phenylalkoxy, phenylalkoxycarbonyl, phenylalkoxycarbonylalkyl, phenylalkanoyl, phenylalkyl, diphenylalkyl, naphthylalkyl, alkoxycarbonylalkyl, alkoxycarbonylmethoxy, carboxyalkyl, aminoalkyl, monoalkylamino, dialkylamino, alkylaminoalkyl, dialkylaminomethyl, dialkylaminoalkyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoyl and alkoxycarbonyl, unless otherwise stated, each contain 1 to 5 carbon atoms in the alkyl and alkoxy moieties, or a tautomer, diastereomer, enantiomer or physiologically acceptable salt thereof.

6,040,290

LIGAND GROWTH FACTOR GP30 THAT BINDS TO THE ERBB-2 RECEPTOR PROTEIN AND INDUCES CELLULAR RESPONSES

Marc E. Lippman, Bethesda, and Ruth Lupu, Gaithersburg, both of Md., assignors to Georgetown University, Washington, D.C.

Division of application No. 08/096,277, Jul. 26, 1993, Pat. No. 5,578,482, which is a continuation-in-part of application No. 07/875,788, Apr. 29, 1992, abandoned, which is a continuation-in-part of application No. 07/640,497, Jan. 14, 1991, abandoned, and a continuation-in-part of application No. 07/917,988, Jul. 24, 1992, abandoned, which is a continuation-in-part of application No. 07/872,114, Apr. 22, 1992, abandoned, which is a continuation of application No. 07/528,438, May 25, 1990, abandoned. This application Aug. 26, 1996, Appl. No. 703,089.

Int. Cl.[7] **C07K** *14/475;17/02;* **A61K** *38/18*

U.S. Cl. 514—12 **7 Claims**

1. A substantially pure protein, wherein said protein:

binds to heparin-Sepharose;

has an apparent molecular weight as measured by SDS PAGE under denaturing conditions of about 30 kDa;

has an apparent molecular weight as measured by SDS PAGE of about 22 kDa after N-glycanase digestion;

has an amino acid sequence of a peptide of approximately 22 kDa molecular weight as measured by SDS PAGE produced by in vitro translation of poly A RNA from MDA-MB-231 cells;

upon hydrolysis with *S. aureus* V8 protease or elastase produces a peptide pattern the same as that produced by the same protease from a peptide of approximately 22 kDa molecular weight as measured by SDS PAGE produced by in vitro translation of poly A RNA from MDA-MB-231 cells.

6,040,291
ANTIMICROBIAL PEPTIDE

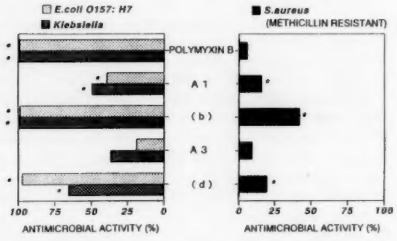
Michimasa Hirata, Morioka, Japan, assignor to Seikagaku Corporation, Tokyo, Japan

Filed Mar. 25, 1999, Appl. No. 276,202

Claims priority, application Japan, Mar. 25, 1998, 10-078136; Jun. 23, 1998, 10-176466

Int. Cl.[7] **A61K** *38/10;38/16;* **B01D** *15/00;* **C07K** *7/08;14/00*

U.S. Cl. 514—12 **16 Claims**



1. An isolated peptide comprising at least the amino acid sequence of SEQ ID NO:1,

Wherein, the Xaa at amino acid 2 comprises a hydrophobic amino acid residue, the Xaa at amino acids 8, 12 and 16 comprise a hydrophilic amino acid residue, and the Xaa at amino acid 11 comprises an arbitrary amino acid residue.

6,040,292
METHODS FOR TREATING DIABETES

Andreas Sommer, Danville, Calif., assignor to Celtrix Pharmaceuticals, Inc., San Jose, Calif.

Filed Jun. 4, 1999, Appl. No. 326,189

Int. Cl.[7] **A61K** *38/00*

U.S. Cl. 514—12 **14 Claims**

1. A method for treatment of diabetes mellitus, comprising:

administering an effective amount of IGF-I/IGFBP-3 complex to a subject suffering from symptoms or complications of diabetes mellitus.

6,040,293
CLAVANINS

Robert I. Lehrer, Santa Monica; Chengquan Zhao, Los Angeles, both of Calif., and In-Hee Lee, Seoul, Rep. of Korea, assignors to The Regents of the University of California, Los Angeles, Calif.

Continuation-in-part of application No. 08/746,160, Nov. 6, 1996. This application Feb. 28, 1997, Appl. No. 810,324.

Int. Cl.[7] **C07K** *14/00;* **A61K** *37/02*

U.S. Cl. 514—13 **16 Claims**

1. A compound in isolated form of the formula

$$X'_1X_2B'_3X_4X_5U_6B_7X_8X_9B_{10}B_{11}X_{12}U_{13}Z_{14}X_{15}X_{16}B^*_{17}U_{18}X_{19}U_{20}B_{21}X_{22}X_{23} \quad (1)$$ (SEQ ID NO:1)

including the salts, esters, amides, and acylated forms thereof,

said compound having antimicrobial activity and an α-helical conformation,

wherein X is a hydrophobic amino acid residue selected from the group consisting of Tyr, Val, Ile, Leu, Met, Phe, and Trp;

X' is a small or a hydrophobic amino acid residue selected from the group consisting of Gly, Ser, Ala, Thr, Tyr, Val, Ile, Leu, Met, Phe, and Trp;

B is a basic amino acid residue selected from the group consisting of Arg, Lys, and His;

B' is a basic or a polar/large amino acid residue selected from the a group consisting of Arg, Lys, His, Asn, and Gln;

B* is a basic or a hydrophobic amino acid residue selected from the group consisting of Arg, Lys, His, Tyr, Val, Ile, Leu, Met, Phe, and Trp;

U is a small amino acid residue selected from the group consisting of Gly, Ser, Ala, and Thr;

Z is a polar/large amino acid residue selected from the group consisting of Asn and Gln; and

wherein one or more $X'_1X_2B'_3X_4X_5$ may be truncated.

6,040,294
FORMULATIONS AND METHODS OF REDUCING TOXICITY OF ANTINEOPLASTIC AGENTS

Frederick H. Hausheer, and Thomas J. Dodd, both of Boerne, Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

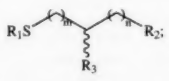
Division of application No. 08/954,678, Oct. 17, 1997, Pat. No. 5,919,816, which is a continuation-in-part of application No. 08/553,005, Nov. 3, 1995, Pat. No. 5,902,610, which is a continuation-in-part of application No. 08/338,379, Nov. 14, 1994, Pat. No. 5,789,000. This application Jan. 6, 1999, Appl. No. 226,760.

Int. Cl.[7] **A61K** *31/52*

U.S. Cl. 514—23 **20 Claims**

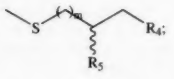
1. A pharmaceutical formulation comprising a solution or suspension of i) an effective amount of an antimetabolite; and ii) a compound of the formula:

(I)



wherein:

R_1 is hydrogen, lower alkyl or



R_2 and R_4 are each individually $SO_3^-M^+$, $PO_3^{2-}M_2^{2+}$, or $PO_2S^{2-}M_2^{2+}$;

R_3 and R_5 are each individually hydrogen, hydroxy or sulfhydryl;

m and n are individually 0, 1, 2, 3 or 4, with the proviso that if m or n is 0, then R_3 is hydrogen; and

M is hydrogen or an alkali metal ion; or

a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable carriers, excipients or diluents.

6,040,295
FORMULATED NUCLEIC ACID COMPOSITIONS AND METHODS OF ADMINISTERING THE SAME FOR GENE THERAPY

Alain Rolland, Houston, and Russell J. Mumper, The Woodlands, both of Tex., assignors to Genemedicine, Inc., Houston, Tex.

Filed Jan. 13, 1995, Appl. No. 372,213

Int. Cl.[7] **A61K** *48/00*

U.S. Cl. 514—44 **9 Claims**

1. A method of administering to a mammal a composition for delivery of a nucleic acid molecule to a muscle tissue, comprising the step of

injecting said composition into a muscle tissue of a mammal, wherein said composition prolong the bioavailability of a nucleic acid molecule and comprises in solution form, an amphiphilic compound admixed with a nucleic acid molecule,

wherein said compound is polyvinyl pyrrolidone, polyvinyl alcohol, polyethylene glycol or propylene glycol,

wherein said compound enhances the delivery of said nucleic acid to muscle cells in vivo, and

wherein said nucleic acid molecule comprises a sequence encoding a gene product.

6,040,296

SPECIFIC ANTISENSE OLIGONUCLEOTIDE COMPOSITION & METHOD FOR TREATMENT OF DISORDERS ASSOCIATED WITH BRONCHOCONSTRICTION AND LUNG INFLAMMATION

Jonathan W. Nyce, Greenville, N.C., assignor to East Carolina University, Greenville, N.C.

Continuation of application No. 08/472,527, Jun. 7, 1995, abandoned. This application Jun. 7, 1995, Appl. No. 472,527. This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *48/00;* **C12N** *15/11;15/09*

U.S. Cl. 514—44 **63 Claims**

1. A pharmaceutical composition, comprising

an oligonucleotide (oligo) in aerosol form, which is effective for alleviating bronchoconstriction or lung inflammation when administered to a mammal, the oligo being antisense to the initiation codon region, the coding region, the 5' or 3' intron-exon junctions or regions within 2 to 10 nucleotides of the intron-exon junctions of a gene encoding an adenosine A_1 receptor or a gene encoding an adenosine A_3 receptor, or antisense to an adenosine A_1 receptor mRNA or an adenosine A_3 receptor mRNA; and

a pharmaceutically acceptable carrier.

37. A method of treating an adenosine A_1 or A_3 mediated respiratory disease or condition associated with bronchoconstriction or lung inflammation, comprising administering directly to the respiration of a mammalian subject in need of such treatment an aerosol of the pharmaceutical composition of claim **1** comprising an amount of the oligo effective for alleviating bronchoconstriction and/or lung inflammation.

6,040,297

DINUCLEOSIDE-5',5'-PYROPHOSPHATES

Antonio De Flora; Umberto Benatti, both of Genoa, and Marco Giovine, Finale Ligure, all of Italy, assignors to Biosearch Italia, S.p.A., and Gruppo Lepetit, S.p.A., both of Italy

PCT No. PCT/EP95/02676, § 371 Date Jan. 14, 1997, § 102(e) Date Jan. 14, 1997, PCT Pub. No. WO96/02554, PCT Pub. Date Feb. 1, 1996

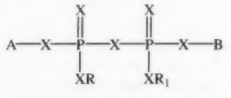
PCT Filed Jul. 10, 1995, Appl. No. 776,138

Claims priority, application European Pat. Off., Jul. 15, 1994, 94202059

Int. Cl.[7] **A61K** *31/70;* **C07H** *19/207*

U.S. Cl. 514—47 **16 Claims**

1. A dinucleoside-5',5'-P^1,P^2-pyrophosphate of the formula (I):



(I)

wherein:

the symbols A and B each independently represent a 5'-C' radical of a non-naturally occurring nucleoside selected from 1-thyminyl-3-azido-2,3-dideoxy-D-riboside and 1-uracilyl-3-azido- 2,3-dideoxy-D-riboside;

the symbols X each independently represent oxygen or sulfur;

the symbols R and R_1 each independently represent hydrogen or an alkyl group of from 1 to 10 carbon atoms, which may optionally contain an unsaturation and/or one or two substituents selected from hydroxy, mercapto, chloro, iodo, fluoro, bromo, amino, (C_1– C_4)alkylamino, di-(C_1–C_4)alkylamino, (C_1–C_4)alkoxy and (C_1–C_4)alkylthio;

and the addition salts of the compounds of formula (I) wherein R and/or R_1 represent hydrogen with bases providing biologically acceptable cations.

2. A dinucleoside of claim **1** wherein the symbol A represents a 5'-C' radical of a non-naturally occurring nucleoside selected from: 1-thyninyl-3-azido-2, 3-dideoxy-D-riboside and 1-uracilyl-3-azido-2,3-dideoxy-D-riboside;

the symbol B represents a 5'-C' radical of a non-naturally occurring nucleoside selected from:

1-thyminyl-3-azido-2,3-dideoxy-D-riboside and 1-uracilyl-3-azido-2,3-dideoxy-D-riboside;

one or two of the symbols X selected from those which are directly linked through a double bond to the phosphorous atom(s) and those that are part of the moiety XR and XR_1 represent(s) oxygen or sulfur and each of the other X represents oxygen;

the symbols R and R_1 each independently represent hydrogen or an alkyl radical of 1 to 4 carbon atoms;

and the addition salts of the compounds wherein R and/or R_1 represent hydrogen with bases providing biologically acceptable cations.

10. A pharmaceutical composition comprising a dinucleoside-5',5'-P^1,P^2-pyrophosphate of the formula (I):

(I)

as defined in claims **1–6** wherein:

the symbols A and B, each independently represents a 5'-C' radical of a non-naturally occurring nucleoside selected from 1-thyminyl-3-azido-2,3dideoxy-D-riboside, 1-(5-fluoro)uracilyl-2-deoxy-D-riboside, 1-uracilyl-3-azido-2,3-dideoxy-D-riboside, 9-guaninyl-2,3-dideoxy-D-riboside, 9-hypoxanthinyl-2,3-dideoxy-D-riboside, 1-cytosinyl- 2,3-dideoxy-D-riboside, and 9-adeninyl-2,3-dideoxy-D-riboside;

the symbols X each independently represent oxygen or sulfur;

the symbols R and R_1 each independently represent hydrogen or an alkyl group of from 1 to 10 carbon atoms;

and the addition salts of the compounds of formula (I) wherein R and/or R_1 represent hydrogen with bases providing biologically acceptable cations in combination with a pharmaceutically acceptable carrier.

6,040,298

METHODS FOR TREATMENT WITH COMPOSITIONS EFFECTIVE AGAINST ACYCLOVIR-RESISTANT STRAINS OF HERPES VIRUSES

Dennis W. Adair, Suisun, Calif.; Karl M. Johnson, Bozeman, Mont., and Earl R. Kern, Birmingham, Ala., assignors to Oclassen Pharmaceuticals, Inc., San Rafael, Calif.

Filed Dec. 23, 1992, Appl. No. 995,843

Int. Cl.[7] **A61K** *31/70;* **C07H** *17/00*

U.S. Cl. 514—50 **27 Claims**

1. A method for treatment of infection or disease caused by a herpes virus strain that is resistant to treatment with acyclovir, which comprises administering to a subject in need of such treatment a composition which comprises an admixture of a pharmaceutically acceptable carrier with a compound of 1-(2'-deoxy-2'-fluoro-β-D-arabinofuranosyl)-5-iodouracil (FIAU), 1-(2'-deoxy-2'-fluoro-β-D-arabinofuranosyl)-5-iodocytosine (FIAC), 1-(2'-deoxy-2'-fluoro-β-D-arabinofuranosyl)uracil (FAU), 1-(2'-deoxy-2'-fluoro-β-D-arabinofuranosyl)-5-methyluracil (FMAU), or 1-(2'-deoxy-2'-fluoro-β-D-arabinofuranosyl)-5-ethyluracil (FEAU), in an amount sufficient to provide an antivirally effective dosage of said compound in the range of about 0.05 to about 10 mg/kg-day, a steady state peak plasma concentration of said compound in the

range of about 0.1 to about 1 μg/ml, or about 0.1, 0.25, 0.5, 1, 5, 10 or 50 mg of said compound.

6,040,299

COLD STORAGE STABILIZED ORGANOPHOSPHORUS INSECTICIDE FORMULATION AND METHOD OF MAKING SAME

Hamid Ullah, Hahira, Ga., assignor to Griffin LLC, Valdosta, Ga.

Filed Oct. 23, 1998, Appl. No. 177,851
Int. Cl.[7] A01N *57/00;57/26*
U.S. Cl. 514—75 **29 Claims**

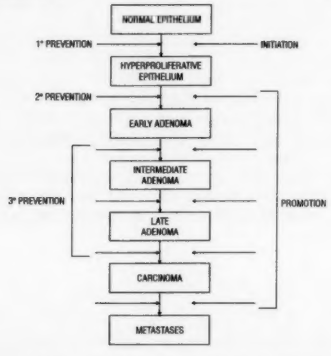
1. In a solid cold stabilized insecticidal formulation that comprises from about 2% to about 40% by weight of a nominally solid organophosphorus insecticide, a solid granular clay carrier therefor, and a cold stabilizing amount of a stabilizer compound for said formulation, the improvement in said formulation which comprises using as the stabilizer compound, from about 0.5% to about 10% by weight of the ultimate formulation of a compound selected from cyclohexanone and N-methylpyrrolidone.

6,040,300

METHOD OF PREVENTING COLON CANCER WITH VITAMIN D_3 ANALOGUES

Thomas A. Brasitus, Olympia Fields; Bruce Marc Bissonnette, Chicago, and Michael D. Sitrin, Flossmoor, all of Ill., assignors to Arch Development Corporation, Chicago, Ill.

Filed Apr. 7, 1995, Appl. No. 418,638
Int. Cl.[7] A61F *2/02;* **A61K** *9/20;9/48*
U.S. Cl. 514—167 **13 Claims**



1. A method of reducing the incidence of colon malignant transformation in a subject comprising administering to the subject an effective amount of a non-calcemic analogue of Vitamin D_3.

6,040,301

ORAL LIQUID ANTIDEPRESSANT SOLUTION

Arnold Titus Philip Skrabanja, Wageningen, Netherlands, and Robert Edward Tully, Ilkley, United Kingdom, assignors to Akzo Nobel, N.V., Arnhem, Netherlands

Filed Apr. 1, 1999, Appl. No. 283,945
Claims priority, application European Pat. Off., Apr. 2, 1998, 98201037
Int. Cl.[7] A01N *43/46;* **A61K** *31/55*
U.S. Cl. 514—214 **11 Claims**

1. A solution or suspension of mirtazapine in admixture with water having a concentration of mirtazapine in the range of from 5 to 110 mg/mL, a pH in the range of from 2.0 to 3.5, and comprising a thickening agent.

6,040,302

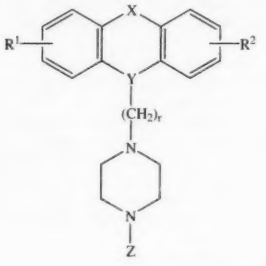
1,4-DISUBSTITUTED PIPERAZINES

Rolf Hohlweg, Kvistgaard; Peter Madsen, Bagsvaerd; Tine Krogh Jørgensen, Herlev; Knud Erik Andersen, Smørum; Brett Watson, Værløse; Zdenek Polivka, Praha 5; Otylie Konigova, Praha 1; Martina Kovandova, Praha 10; Alexandra Silhánková, and Vladimir Valenta, both of Praha 4, all of Denmark, assignors to Novo Nordisk A/S, Bagsværd, Denmark

Division of application No. 08/943,726, Oct. 3, 1997, Pat. No. 5,916,889. This application Mar. 18, 1999, Appl. No. 271,565.
Claims priority, application Denmark, Oct. 4, 1996, 1090/96
Int. Cl.[7] A61K *31/55;* **C07D** *401/06;401/14*
U.S. Cl. 514—217 **17 Claims**

1. A compound of formula I

(I)



wherein

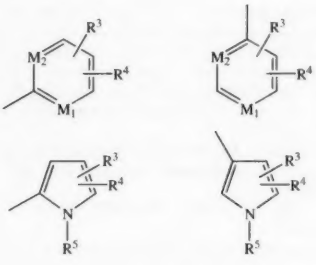
R^1 and R^2 independently are hydrogen, halogen, trifluoromethyl, hydroxy, C_{1-6}-alkyl or C_{1-6}-alkoxy; and

X is $—CH_2CH_2—$; and

Y is $>N—CH_2—$ wherein only the underscored atom participates in the ring system; and

r is 1, 2 or 3; and

Z is selected from



wherein

M_1 and M_2 independently are CH or N; and

R^5 is hydrogen, C_{1-6}-alkyl, phenyl or benzyl; and

R^3 is hydrogen, nitro or cyano in the six-membered rings and hydrogen, halogen, trifluoromethyl, nitro or cyano in the five-membered rings; and

R^4 is nitro, cyano, $(CH_2)_mCOR^{11}$, $(CH_2)_mOH$ or $(CH_2)_mSO_2R^{11}$ in the six-membered rings and hydrogen, halogen, trifluoromethyl, nitro, cyano, $(CH_2)_mCOR^{11}$, $(CH_2)_mOH$ or $(CH_2)_mSO_2R^{11}$ in the five-membered rings, wherein R^{11} is hydroxy, C_{1-6}-alkoxy or NHR^{12}, wherein R^{12} is hydrogen or C_{1-6}-alkyl; and m is 0, 1 or 2;

or a pharmaceutically acceptable salt thereof.

6,040,303

7-PHENYL-1, 4-DIAZEPANE COMPOUNDS, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Samuel David, Hannover; Jochen Antel, Bad Muender; Reinhard Brueckner, Hannover; Dieter Ziegler, Hemmingen; Christian Eeckhout, Lindwedel, all of Germany; Gerhard-Wilhelm Bielenberg, Alfeld, Belgium, and Michael Peck, Braine le Chateau, Belgium, assignors to Solvay Pharmaceuticals GmbH, Hannover, Germany

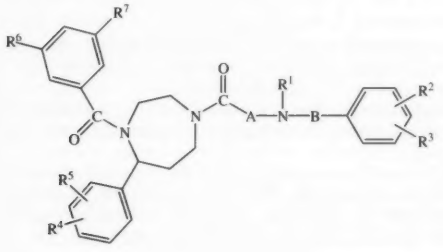
Filed Aug. 27, 1998, Appl. No. 141,312

Claims priority, application Germany, Aug. 27, 1997, 197 37 334

Int. Cl.[7] **A61K** *31/55;* **C07D** *243/08*

U.S. Cl. 514—218 **6 Claims**

1. A compound corresponding to the formula I:



wherein

R^1 is hydrogen or lower alkyl,

R^2 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl, and

R^3 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl, or

R^2 and R^3 together are alkylenedioxy with 1 to 2 carbon atoms, bonded to adjacent carbon atoms of the phenyl ring,

R^4 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl, and

R^5 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl, or

R^4 and R^5 together are alkylenedioxy with 1 to 2 carbon atoms, bonded to adjacent carbon atoms of the phenyl ring,

R^6 is lower alkyl, halogen or trifluoromethyl,

R^7 is lower alkyl, halogen or trifluoromethyl,

A is a $—(CH_2)_n—$ group in which n represents an integer from 1 to 3, or an $—NH—(CH_2)_m—$ group in which m represents an integer from 2 to 3, and

B is an alkylene chain with 1 to 3 carbon atoms, optionally substituted by lower alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

6,040,304

FORMULATIONS AND METHODS OF REDUCING TOXICITY OF ANTINEOPLASTIC AGENTS

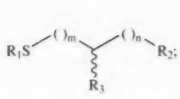
Frederick H. Hausheer, and Thomas J. Dodd, both of Boerne, Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

Division of application No. 08/954,678, Oct. 17, 1997, Pat. No. 5,919,816, which is a continuation-in-part of application No. 08/553,005, Nov. 3, 1995, Pat. No. 5,902,610, which is a continuation-in-part of application No. 08/338,379, Nov. 14, 1994, Pat. No. 5,789,000. This application Jan. 6, 1999, Appl. No. 225,695.

Int. Cl.[7] **A61K** *31/35;31/40;31/55*

U.S. Cl. 514—221 **20 Claims**

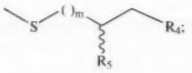
1. A pharmaceutical formulation comprising a solution or suspension of i) an effective amount of an Antibiotic or Antiviral agent; and ii) a compound of the formula:



(I)

wherein:

R_1 is hydrogen, lower alkyl or



R_2 and R_4 are each individually $SO_3^-M^+$, $PO_3^{2-}M_2^{2+}$, or $PO_2S^{2-}M_m^{2+}$;

R_3 and R_5 are each individually hydrogen, hydroxy or sulfhydryl;

m and n are individually 0, 1, 2, 3 or 4, with the proviso that if m or n is 0, then R_3 is hydrogen; and

M is hydrogen or an alkali metal ion; or

a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable carriers, excipients or diluents.

6,040,305

COMPOUNDS USEFUL FOR INHIBITION OF FARNESYL PROTEIN TRANSFERASE

Arthur G. Taveras, Denville, and George F. Njoroge, Union, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

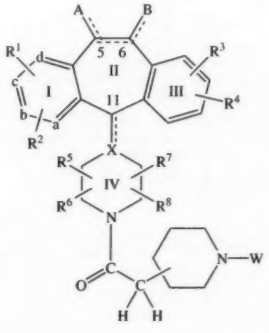
Provisional application No. 60/026,114, Sep. 13, 1996, Provisional application No. 60/050,009, Jun. 17, 1997. This application Sep. 11, 1997, Appl. No. 927,470.

Int. Cl.[7] **A61K** *31/445;31/495;31/535;* **C07D** *401/14;403/14*

U.S. Cl. 514—232.8 **31 Claims**

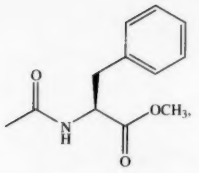
1. A compound of the formula:

(1.0)



or a pharmaceutically acceptable salt or solvate thereof, wherein: one of a, b, c and d represents N or NR^9 wherein R^9 is O^-, —CH3 or $—(CH_2)_nCO_2H$ wherein n is 1 to 3, and the remaining a, b, c and d groups represent CR^1 or CR^2;

each R^1 and each R^2 is independently selected from H, halo, $—CF_3$, $—OR^{10}$, $—COR^{10}$, $—SR^{10}$, $—S(O)_tR^{11}$ (wherein t is 0, 1 or 2), —SCN, $—N(R^{10})_2$, $—NR^{10}R^{11}$, $—NO_2$, $—OC(O)R^{10}$, $—CO_2R^{10}$, $—OCO_2R^{11}$, —CN, $—NHC(O)R^{10}$, $—NHSO_2R^{10}$, —CONHR[10], $—CONHCH_2CH_2OH$, $—NR^{10}COOR^{11}$,



$—SR^{11}C(O)OR^{11}$, $—SR^{11}N(R^{75})_2$ wherein each R^{75} is independently selected from H and $—C(O)OR^{11}$, benzotriazol-1-yloxy, tetrazol-5-ylthio, or substituted tetrazol-5-ylthio, alkynyl, alkenyl or alkyl, said alkyl or alkenyl group optionally being substituted with halo, $—OR^{10}$ or $—CO_2R^{10}$;

R^3 and R^4 are the same or different and each independently represents H, any of the substituents of R^1 and R^2, or R^3 and R^4 taken together represent a saturated or unsaturated C_5–C_7 fused ring to the benzene ring (Ring III);

R^5, R^6, R^7 and R^8 each independently represents H, $—CF_3$, $—COR^{10}$, alkyl or aryl, said alkyl or aryl optionally being substituted with $—OR^{10}$, $—SR^{10}$, $—S(O)_tR^{11}$, $—NR^{10}COOR^{11}$, $—N(R^{10})_2$, $—NO_2$, $—COR^{10}$, $—OCOR^{10}$, $—OCO_2R^{11}$, $—CO_2R^{10}$, OPO_3R^{10} or R^5 is combined with R^6 to represent =O or =S and/or R^7 is combined with R^8 to represent =O or =S;

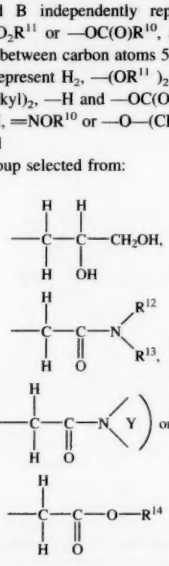
R^{10} represents H, alkyl, aryl, or aralkyl;

R^{11} represents alkyl or aryl;

X represents CH or C, which C contain a double bond (represented by the dotted line) to carbon atom 11;

the dotted line between carbon atoms 5 and 6 represents an optional double bond, such that when a double bond is present, A and B independently represent $—R^{10}$, halo, $—OR^{11}$, $—OCO_2R^{11}$ or $—OC(O)R^{10}$, and when no double bond is present between carbon atoms 5 and 6, A and B each independently represent H_2, $—(OR^{11})_2$; H and halo, dihalo, alkyl and H, $(alkyl)_2$, —H and $—OC(O)R^{10}$, H and $—OR^{10}$, =O, aryl and H, $=NOR^{10}$ or $—O—(CH_2)_p—O—$ wherein p is 2, 3 or 4; and

W represents a group selected from:



wherein:

R^{12} is selected from the group consisting of: (1) H; (2) alkyl; (3) aryl; (4) arylalkyl;

R^{13} is selected from the group consisting of: (1) H; (2) alkyl; (3) alkoxy; (4) heterocycloalkyl; (5) aryl; and (5) aralkyl;

R^{14} is selected from the group consisting of: (1) H; (2) alkyl; (3) aryl; and (4) heteroaryl;

ring

represents a heterocycloalkyl ring wherein Y represents the remainder of the ring, said remainder comprising carbon atoms and optionally a hetero atom selected from the group consisting of: NH, NR^{15}, O and S, and said remainder optionally having an aryl ring fused thereto;

R^{15} represents $—C(O)OR^{16}$; and

R^{16} represents alkyl.

6,040,306

METHOD OF TREATING PSORIASIS, ARTHRITIS AND REDUCING THE TOXICITY OF CANCER CHEMOTHERAPY

Donald Herman Batts, Kalamazoo, Mich., and Roger G. Ulrich, Gurnee, Ill., assignors to Pharmacia & Upjohn Company

Provisional application No. 60/065,689, Nov. 18, 1997, Provisional application No. 60/071,297, Jan. 16, 1998, Provisional application No. 60/075,247, Feb. 19, 1998, Provisional application No. 60/077,672, Mar. 12, 1998. This application Nov. 10, 1998, Appl. No. 189,466.

Int. Cl.[7] **A61P** *17/06;19/02*

U.S. Cl. 514—236.8 **33 Claims**

1. A method of treating a person who has psoriasis which comprises administering to the patient an anti-psoriasis effective amount of an oxazolidinone selected from the group consisting of

(S)-N-[[3-[3-fluoro-4-[4-(hydroxyacetyl)-1-piperazinyl]-phenyl]-2-oxo- 5-oxazolidinyl]methyl]acetamide,

(S)-N-[[3-[3-fluoro-4-(4-morpholinyl)phenyl]-2-oxo-5-oxazolidinyl]methyl]acetamide,

[4(S)-cis]-(–)-N-[[3-[3-Fluoro-4-(tetrahydro-1-oxido-2H-thiopyran-4-yl) phenyl]-2-oxo-5-oxazolidinyl]methyl]acetamide,

N-((5S)-3-(3-fluoro-4-(4-(2-fluoroethyl)-3-oxopiperazin-1-yl)phenyl)- 2-oxooxazolidin-5-ylmethyl)acetamide,

(S)-N-[[3-[5-(3-pyridyl)thiophen-2-yl]-2-oxo-5-oxazohdinyl]methyl]acetamide and

(S)-N-[[3-[5-(4-pyridyl)pyrid-2-yl]-2-oxo-5-oxazolidinyl]methyl]acetamide and pharmaceutically acceptable salts thereof.

6,040,307

METHODS AD COMPOSITIONS OF (–) KETOCONAZOLE FOR TREATING FUNGAL YEAST AND DERMATOPHYTE INFECTIONS

Nancy M. Gray, Marlborough, Mass., and Raymond Leon Woosley, Washington, D.C., assignors to Sepracor Inc., Marlborough, Mass.

Continuation of application No. 08/906,129, Aug. 5, 1997, abandoned, which is a continuation of application No. 08/558,768, Nov. 15, 1995, abandoned, which is a continuation of application No. 08/281,858, Jul. 28, 1994, abandoned, which is a continuation of application No. 07/995,291, Dec. 22, 1992, abandoned. This application May 18, 1999, Appl. No. 314,229.

Int. Cl.[7] **A61K** *31/495;31/50*

U.S. Cl. 514—252 **8 Claims**

1. A method for treating local and systemic fungal, yeast and dermatophyte infections in a human which comprises administering to the human, in need of antiinfective therapy, an amount of (–)

ketoconazole, or a pharmaceutically acceptable salt thereof, substantially free of its (+) stereoisomer, said amount being sufficient to alleviate said infections.

6,040,308

CHROMAN DERIVATIVES

Günther Häusler; Rolf Gericke, both of Seeheim; Hanns Wurziger, Darmstadt; Manfred Baumgarth, Darmstadt; Inge Lues, Darmstadt; Jacques De Peyer, Seeheim, and Rolf Bergmann, Reichelsheim, all of Germany, assignors to Merck Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

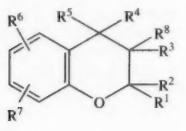
Division of application No. 07/766,725, Sep. 27, 1991, Pat. No. 5,387,587, which is a continuation-in-part of application No. 07/766,362, Sep. 26, 1991, abandoned, which is a continuation-in-part of application No. 07/655,190, Feb. 13, 1991, abandoned, which is a continuation of application No. 07/137,201, Dec. 23, 1987, abandoned, and a continuation-in-part of application No. 07/660,080, Feb. 25, 1991, abandoned, which is a division of application No. 07/347,710, May 5, 1989, Pat. No. 5,013,853, and a continuation-in-part of application No. 07/664,441, Feb. 21, 1991, abandoned, which is a continuation of application No. 07/367,281, Jun. 15, 1989, abandoned, and a continuation-in-part of application No. 07/420,978, Oct. 13, 1989, abandoned. This application Oct. 28, 1994, Appl. No. 330,957.

Claims priority, application Germany, Dec. 23, 1986, 36 44 094; Aug. 7, 1987, 37 26 261; May 6, 1988, 38 15 504; Jun. 16, 1988, 38 20 506; Oct. 14, 1988, 38 35 011

Int. Cl.[7] **A61K** *31/50;* **C07D** *405/02;405/04*

U.S. Cl. 514—253 **17 Claims**

1. A chroman of the formula



wherein

R^1 is A,

R^2 is H or A,

R^1 and R^2 together are also alkylene having 3–6 C atoms,

R^3 is, OH, or OAc,

R^4 is H,

R^3 and R^4 together are also a bond,

R^5 is 1H-6-pyridazinon-1-yl, which is unsubstituted or monosubstituted or disubstituted by A, F, Cl, Br, I, OA, OAc, NO_2, NH_2, AcNH, HOOC and/or AOOC,

R^6 and R^7 are each H, A, HO, AO, CHO, ACO, ACS, HOOC, AOOC, AO—CS, ACOO, A—CS—O, hydroxyalkyl having 1–6 C atoms, mercaptoalkyl having 1–6 C atoms, NO_2, NH_2, NHA, NA_2, CN, F, Cl, Br, I, CF_3, ASO, ASO_2, AO—SO, AO—SO_2, AcNH, AO—CO—NH, H_2NSO, HANSO, A_2NSO, H_2NSO_2, $HANSO_2$, A_2NSO_2, H_2NCO, HANCO, A_2NCO, H_2NCS, HANCS, A_2NCS, ASONH, ASO_2NH, AOSONH, $AOSO_2NH$, ACO-alkyl, nitroalkyl, cyanoalkyl, A—C(=NOH) or A—C(=NNH_2),

R^8 is H

A is alkyl having 1–6 C atoms;

alkyl is of 1–6 C atoms; and

Ac is alkanoyl having 1–8 C atoms or aroyl having 7–11 C atoms, or a physiologically acceptable salt thereof.

6,040,309

BENZOTHIOPHENE DERIVATIVES USEFUL IN THERAPY

Kevin Neil Dack, Sandwich, United Kingdom, and Roger Peter Dickinson, New York, N.Y., assignors to Pfizer, Inc., New York, N.Y.

Filed Dec. 3, 1998, Appl. No. 204,789

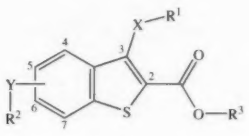
Claims priority, application United Kingdom, Dec. 8, 1997, 9725953

Int. Cl.[7] **C07D** *333/64;* **A61K** *31/38*

U.S. Cl. 514—253 **10 Claims**

1. A compound of formula I,

I



wherein

X represents O or $S(O)_m$;

R^1 and R^2 independently represent phenyl, naphthyl or heteroaryl containing 1, 2 or 3 heteroatoms independently selected from N, S and O; the ring being optionally fused to a saturated or unsaturated heterocyclic ring containing 1, 2 or 3 heteroatoms independently selected from N, S and O; the ring system as a whole being optionally substituted by one or more groups selected from OH, halogen, CN, NH_2, $(CH_3SO_2)HN$, $(CH_3SO)_2N$, C_{1-6} alkyl (optionally substituted by OH or CH_3CO_2) and C_{1-6} alkoxy;

Y represents a bond, O, $(CH_2)_n$, $O(CH_2)_n$, $(CH_2)_nO$, or $CH(C_{1-6}$ alkyl)O;

R^3 represents H or C_{1-6} alkyl;

m represents 0, 1, or 2; and

n represents 1, or 2;

provided that:

(i) when R^2 is linked to Y via a nitrogen atom, then Y does not represent O, $O(CH_2)_n$ or CH_2O; and

(ii) when R^3 represents H, then neither R^1 nor R^2 is substituted by $(CH_3SO_2)_2N$;

or a pharmaceutically acceptable salt thereof.

6,040,310

4-AMINOPYRROLE (3,2-D) PYRIMIDINES AS NEUROPEPTIDE Y RECEPTOR ANTAGONISTS

Robert L. Dow, Waterford, and Bonnie F. Tate, Salem, both of Conn., assignors to Pfizer Inc., New York, N.Y.

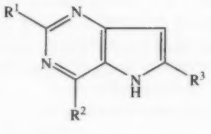
Provisional application No. 60/055,307, Aug. 5, 1997. This application Jul. 29, 1998, Appl. No. 124,025.

Int. Cl.[7] **A61K** *31/505*

U.S. Cl. 514—258 **9 Claims**

1. A method of inhibiting or alleviating a pathological condition or physiological disorder associated with neuropeptide Y in a mammalian subject, comprising administering to said mammalian subject an effective amount of a compound of Formula I or a pharmaceutically acceptable salt thereof;

I

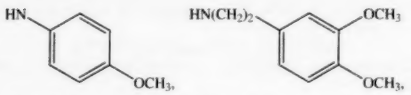


wherein:

R^1 is methyl;

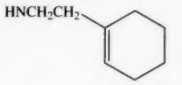
R^3 is phenyl; and

R^2 is selected from substituents consisting of NEt_2, $HN(CH_2)_2NEt_2$, $HN(CH_2)_3COOH$, $HNCH_2CH_2OH$, HNPh, $HN(CH_2)_2Ph$



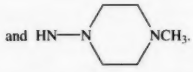
, piperidinyl,

morpholinyl, $NH\,NH_2$, $HNCH(CH_3)_2$, $HN(CH_2)_3CH_3$, $HNCH_2CH(CH_3)_2$, $HNCH(CH_3)CH_2(CH_2)_3CH_3$, $HNCH_2CH{=}CH_2$,



, $HNCH_2C_6H_5$,

and



6,040,311

INTEGRIN RECEPTOR ANTAGONISTS

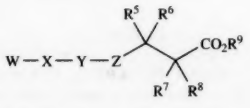
Mark E. Duggan, Schwenksville, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Provisional application No. 60/094,478, Jul. 29, 1998. This application Jul. 28, 1999, Appl. No. 362,528.

Int. Cl.[7] **A61K** *31/505;31/435;* **C07D** *239/42;471/04*

U.S. Cl. 514—275 **33 Claims**

1. A compound of the formula



wherein W is selected from the group consisting of

a 5- or 6-membered monocyclic aromatic or nonaromatic ring system having 1, 2, 3 or 4 heteroatoms selected from the group consisting of N, O, and S wherein the ring nitrogen atoms are unsubstituted or substituted with one R^1 substituent and the ring carbon atoms are unsubstituted or substituted with one or two R^1 substituents, and

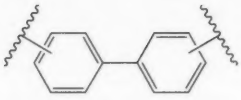
a 9- to 1 4-membered polycyclic ring system, wherein one or more of the rings is aromatic, and wherein the polycyclic ring system has 1, 2, 3 or 4 heteroatoms selected from the group consisting of N, O, and S wherein the ring nitrogen atoms are unsubstituted or substituted with one R^1 substituent and the ring carbon atoms are unsubstituted or substituted with one or two R^1substituents;

X is selected from the group consisting of

$-(CH_2)_v-$, and

$-(CH_2)_vNR^4(CH_2)_v-$; wherein any methylene (CH_2) carbon atom, other than in R^4, is either unsubstituted or substituted with one or two R^3 substitutents;

Y is



wherein the biphenyl ring system is either unsubstituted or substituted with one or more R^1 substituents;

Z is selected from the group consisting of

$-CH_2CH_2-$ and $-CH{=}CH-$, wherein either carbon atom can be substituted by one or two R^3 substituents;

each R^1 is independently selected from the group consisting of hydrogen, halogen, C_{1-10} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloheteroalkyl, C_{3-8} cycloalkyl C_{1-6} alkyl, C_{3-8} cycloheteroalkyl C_{1-6} alkyl, aryl, aryl C_{1-8} alkyl, amino, amino C_{1-8} alkyl, C_{1-3} acylamino, C_{1-3} acylamino C_{1-8} alkyl, $(C_{1-6}$ alkyl$)_p$amino, $(C_{1-6}$ alkyl$)_p$amino C_{1-8} alkyl, C_{1-4} alkoxy, C_{1-4} alkoxy C_{1-6} alkyl, hydroxycarbonyl, hydroxycarbonyl C_{1-6} alkyl, C_{1-3} alkoxycarbonyl, C_{1-3} alkoxycarbonyl C_{1-6} alkyl, hydroxycarbonyl- C_{1-6} alkyloxy, hydroxy, hydroxy C_{1-6} alkyl, C_{1-6} alkyloxy-C_{1-6} alkyl, nitro, cyano, trifluoromethyl, trifluoromethoxy, trifluoroethoxy, C_{1-8} alkyl-$S(O)_p$, $(C_{1-8}$ alkyl$)_p$aminocarbonyl, C_{1-8} alkyloxycarbonylamino, $(C_{1-8}$ alkyl$)_p$aminocarbonyloxy, (aryl C_{1-8} alkyl$)_p$amino, (aryl)$_p$amino, aryl C_{1-8} alkylsulfonylamino, and C_{1-8} alkylsulfonylamino;

or two R^1 substituents, when on the same carbon atom, are taken together with the carbon atom to which they are attached to form a carbonyl group;

each R^3 is independently selected from the group consisting of hydrogen,
aryl,
C_{1-10} alkyl,
aryl—$(CH_2)_r$—O—$(CH_2)_s$,
aryl—$(CH_2)_r S(O)_p$—$(CH_2)_s$,
aryl—$(CH_2)_r$—C(O)—$(CH_2)_s$,
aryl—$(CH_2)_r C(O)$—$N(R^4)$—$(CH_2)_s$,
aryl—$(CH_2)_r$—$N(R^4)$—C(O)—$(CH_2)_s$,
aryl—$(CH_2)_r$—$N(R^4)$—$(CH_2)_s$,
halogen,
hydroxyl,
oxo,
trifluoromethyl,
C_{1-8} alkylcarbonylamino,
aryl C_{1-5} alkoxy,
C_{1-5} alkoxycarbonyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl,
C_{1-6} alkylcarbonyloxy,
C_{3-8} cycloalkyl,
$(C_{1-6}$ alkyl$)_p$amino,
amino C_{1-6} alkyl,
arylaminocarbonyl,
aryl C_{1-5} alkylaminocarbonyl,
aminocarbonyl,
aminocarbonyl C_{1-6} alkyl,
hydroxycarbonyl,
hydroxycarbonyl C_{1-6} alkyl,
$HC{\equiv}C-(CH_2)_r-$,
C_{1-6} alkyl—$C{\equiv}C-(CH_2)_r-$,
C_{3-7} cycloalkyl—$C{\equiv}C-(CH_2)_r-$,
aryl—$C{\equiv}C-(CH_2)_r-$,
C_{1-6} alkylaryl—$C{\equiv}C-(CH_2)_r-$,
$CH_2{=}CH-(CH_2)_r-$,
C_{1-6} alkyl—$CH{=}CH-(CH_2)_r-$,
C_{3-7} cycloalkyl—$CH{=}CH-(CH_2)_r-$,
aryl—$CH{=}CH-(CH_2)_r-$,

C_{1-6} alkylaryl—CH=CH—$(CH_2)_r$—,
C_{1-6} alkyl—SO_2—$(CH_2)_r$—,
C_{1-6} alkylaryl—SO_2—$(CH_2)_r$—,
C_{1-6} alkoxy,
aryl C_{1-6} alkoxy,
aryl C_{1-6} alkyl,
$(C_{1-6}$ alkyl$)_p$amino C_{1-6} alkyl,
$(aryl)_p$amino,
$(aryl)_p$amino C_{1-6} alkyl,
$(aryl\ C_{1-6}$ alkyl$)_p$amino,
$(aryl\ C_{1-6}$ alkyl$)_p$amino C_{1-6} alkyl,
arylcarbonyloxy,
aryl C_{1-6} alkylcarbonyloxy,
$(C_{1-6}$ alkyl$)_p$aminocarbonyloxy,
C_{1-8} alkylsulfonylamino,
arylsulfonylamino,
C_{1-8} alkylsulfonylamino C_{1-6} alkyl,
arylsulfonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonylamino,
aryl C_{1-6} alkylsulfonylamino C_{1-6} alkyl,
C_{1-8} alkoxycarbonylamino,
C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
aryloxyearbonylamino C_{1-8} alkyl,
aryl C_{1-8} alkoxycarbonylamino,
aryl C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
C_{1-8} alkylcarbonylamino,
C_{1-8} alkylcarbonylamino C_{1-6} alkyl,
arylcarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonylamino,
aryl C_{1-6} alkylcarbonylamino C_{1-6} alkyl,
aminocarbonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
$(aryl)_p$aminocarbonyl amino C_{1-6} alkyl,
$(aryl\ C_{1-8}$ alkyl$)_p$aminocarbonylamino,
$(aryl\ C_{1-8}$ alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
aminosulfonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
$(aryl)_p$aminosulfonylamino C_{1-6} alkyl,
$(aryl\ C_{1-8}$ alkyl$)_p$aminosulfonylamino ,
$(aryl\ C_{1-8}$ alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
C_{1-6} alkylsulfonyl,
C_{1-6} alkylsulfonyl C_{1-6} alkyl,
arylsulfonyl C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonyl,
aryl C_{1-6} alkylsulfonyl C_{1-6} alkyl,
C_{1-6} alkylcarbonyl,
C_{1-6} alkylcarbonyl C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonyl,
aryl C_{1-6} alkylcarbonyl C_{1-6} alkyl,
C_{1-6} alkylthiocarbonylamino,
C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
arylthiocarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylthiocarbonylamino,
aryl C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl C_{1-6} alkyl,
$(aryl)_p$aminocarbonyl C_{1-6} alkyl,
$(aryl\ C_{1-8}$ alkyl$)_p$aminocarbonyl, and
$(aryl\ C_{1-8}$ alkyl$)_p$aminocarbonyl C_{1-6} alkyl;

or two R^3 substituents, when on the same carbon atom are taken together with the carbon atom to which they are attached to form a carbonyl group or a cyclopropyl group,

wherein any of the alkyl groups of R^3 are either unsubstituted or substituted with one to three R^1 substituents, and provided that each R^3 is selected such that in the resultant compound the carbon atom or atoms to which R^3 is attached is itself attached to no more than one heteroatom;

each R^4 is independently selected from the group consisting of

hydrogen,
aryl,
aminocarbonyl,
C_{3-8} cycloalkyl,
amino C_{1-6} alkyl,
$(aryl)_p$aminocarbonyl,
$(aryl\ C_{1-5}$ alkyl$)_p$aminocarbonyl,
hydroxycarbonyl C_{1-6} alkyl,
C_{1-8} alkyl,
aryl C_{1-6} alkyl,
$(C_{1-6}$ alkyl$)_p$amino C_{2-6} alkyl,
$(aryl\ C_{1-6}$ alkyl$)_p$amino C_{2-6} alkyl,
C_{1-8} alkylsulfonyl,
C_{1-8} alkoxycarbonyl,
aryloxycarbonyl,
aryl C_{1-8} alkoxycarbonyl,
C_{1-8} alkylcarbonyl,
arylcarbonyl,
aryl C_{1-6} alkylcarbonyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl,
aminosulfonyl,
C_{1-8} alkylaminosulfonyl,
$(aryl)_p$aminosulfonyl,
$(aryl\ C_{1-8}$ alkyl$)_p$aminosulfonyl,
arylsulfonyl,
arylC_{1-6} alkylsulfonyl,
C_{1-6} alkylthiocarbonyl,
arylthiocarbonyl, and
aryl C_{1-6} alkylthiocarbonyl,

wherein any of the alkyl groups of R^4 are either unsubstituted or substituted with one to three R^1 substituents;

R^5 and R^6 are each independently selected from the group consisting of

hydrogen,
C_{1-10} alkyl,
aryl,
aryl—$(CH_2)_r$—O—$(CH_2)_s$,
aryl—$(CH_2)_r$S(O)$_p$—$(CH_2)_s$,
aryl—$(CH_2)_r$—C(O)—$(CH_2)_s$,
aryl—$(CH_2)_r$—C(O)—N(R_4)—$(CH_2)_s$,
aryl—$(CH_2)_r$—N(R_4)—C(O)—$(CH_2)_s$,
aryl—$(CH_2)_r$—N(R^4)—$(CH_2)_s$,
halogen,
hydroxyl,
C_{1-8} alkylcarbonylamino,
aryl C_{1-5} alkoxy,
C_{1-5} alkoxycarbonyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl,
C_{1-6} alkylcarbonyloxy,
C_{3-8} cycloalkyl,
$(C_{1-6}$ alkyl$)_p$amino,
amino C_{1-6} alkyl,
arylaminocarbonyl,
aryl C_{1-5} alkylaminocarbonyl,
aminocarbonyl,
aminocarbonyl C_{1-6} alkyl,
hydroxycarbonyl,
hydroxycarbonyl C_{1-6} alkyl,
HC≡C—$(CH_2)_r$—,
C_{1-6} alkyl—C≡C—$(CH_2)_r$—,
C_{3-7} cycloalkyl—C≡C—$(CH_2)_r$—,
aryl—C≡C—$(CH_2)_r$—,
C_{1-6} alkylaryl—C≡C—$(CH_2)_r$—,
CH_2=CH—$(CH_2)_r$—,
C_{1-6} alkyl—CH=CH—$(CH_2)_r$—,
C_{3-7} cycloalkyl—CH=CH—$(CH_2)_r$—,
aryl—CH=CH—$(CH_2)_r$—,
C_{1-6} alkylaryl—CH=CH—$(CH_2)_r$—,
C_{1-6} alkyl—SO_2—$(CH_2)_r$—,
C_{1-6} alkylaryl—SO_2—$(CH_2)_r$—,
C_{1-6} alkoxy,
aryl C_{1-6} alkoxy,
aryl C_{1-6} alkyl,
$(C_{1-6}$ alkyl$)_p$amino C_{1-6} alkyl,
$(aryl)_p$amino,
$(aryl)_p$amino C_{1-6} alkyl,
$(aryl\ C_{1-6}$ alkyl$)_p$amino,
$(aryl\ C_{1-6}$ alkyl$)_p$amino C_{1-6} alkyl,
arylcarbonyloxy,
aryl C_{1-6} alkylcarbonyloxy,
$(C_{1-6}$ alkyl$)_p$aminocarbonyloxy,

C_{1-8} alkylsulfonylamino,
arylsulfonylamino,
C_{1-8} alkylsulfonylamino C_{1-6} alkyl,
arylsulfonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonylamino,
aryl C_{1-6} alkylsulfonylamino C_{1-6} alkyl,
C_{1-8} alkoxycarbonylamino,
C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
aryloxycarbonylamino C_{1-8} alkyl,
aryl C_{1-8} alkoxycarbonylamino,
aryl C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
C_{1-8} alkylcarbonylamino,
C_{1-8} alkylcarbonylamino C_{1-6} alkyl,
arylcarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonylamino,
aryl C_{1-6} alkylcarbonylamino C_{1-6} alkyl,
aminocarbonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
$(aryl)_p$aminocarbonylamino C_{1-6} alkyl,
(aryl C_{1-8} alkyl$)_p$aminocarbonylamino,
(aryl C_{1-8} alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
aminosulfonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
$(aryl)_p$aminosulfonylamino C_{1-6} alkyl,
(aryl C_{1-8} alkyl$)_p$aminosulfonylamino,
(aryl C_{1-8} alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
C_{1-6} alkylsulfonyl,
C_{1-6} alkylsulfonyl C_{1-6} alkyl,
arylsulfonyl C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonyl,
aryl C_{1-6} alkylsulfonyl C_{1-6} alkyl,
C_{1-6} alkylcarbonyl,
C_{1-6} alkylcarbonyl C_{1-6} alkyl,
arylcarbonyl C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonyl,
aryl C_{1-6} alkylcarbonyl C_{1-6} alkyl,
C_{1-6} alkylthiocarbonylamino,
C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
arylthiocarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylthiocarbonylamino,
aryl C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl C_{1-6} alkyl,
$(aryl)_p$aminocarbonyl C_{1-6} alkyl,
(aryl C_{1-8} alkyl$)_p$aminocarbonyl, and
(aryl C_{1-8} alkyl$)_p$aminocarbonyl C_{1-6} alkyl;
or R^5 and R^6 are taken together with the carbon atom to which they are attached to form a carbonyl group,

wherein any of the alkyl groups of R^5 or R^6 are either unsubstituted or substituted with one to three R^1 substituents,

and provided that each R^5 and R^6 are selected such that in the resultant compound the carbon atom to which R^5 and R^6 are attached is itself attached to no more than one heteroatom;

R^7 and R^8 are each independently selected from the group consisting of
hydrogen,
C_{1-10} alkyl,
aryl,
aryl—$(CH_2)_r$—O—$(CH_2)_s$,
aryl—$(CH_2)_r S(O)_p$—$(CH_2)_s$,
aryl—$(CH_2)_r$—C(O)—$(CH_2)_s$,
aryl—$(CH_2)_r$—C(O)—$N(R^4)$—$(CH_2)_s$,
aryl—$(CH_2)_r N(R^4)$—C(O)—$(CH_2)_s$—,
aryl—$(CH_2)_r$—$N(R^4)$—$(CH_2)_s$,
halogen,
hydroxyl,
C_{1-8} alkylcarbonylamino,
aryl C_{1-5} alkoxy,
C_{1-5} alkoxycarbonyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl,
C_{1-6} alkylcarbonyloxy,
C_{3-8} cycloalkyl,
$(C_{1-6}$ alkyl$)_p$amino,
amino C_{1-6} alkyl,
arylaminocarbonyl,
aryl C_{1-5} alkylaminocarbonyl,
aminocarbonyl,
aminocarbonyl C_{1-6} alkyl,
hydroxycarbonyl,
hydroxycarbonyl C_{1-6} alkyl,
HC≡C—$(CH_2)_r$—,
C_{1-6} alkyl—C≡C—$(CH_2)_r$—,
C_{3-7} cycloalkyl—C≡C—$(CH_2)_r$—,
aryl—C≡C—$(CH_2)_r$—,
C_{1-6} alkylaryl—C≡C—$(CH_2)_r$—,
CH_2=CH—$(CH_2)_r$—,
C_{1-6} alkyl—CH=CH—$(CH_2)_r$—,
C_{3-7} cycloalkyl—CH=CH—$(CH_2)_r$—,
aryl—CH=CH—$(CH_2)_r$—,
C_{1-6} alkylaryl—CH=CH—$(CH_2)_r$—,
C_{1-6} alkyl—SO_2—$(CH_2)_r$—,
C_{1-6} alkylaryl—SO_2—$(CH_2)_r$—,
C_{1-6} alkoxy,
aryl C_{1-6} alkoxy,
aryl C_{1-6} alkyl,
$(C_{1-6}$ alkyl$)_p$amino C_{1-6} alkyl,
$(aryl)_p$amino,
$(aryl)_p$amino C_{1-6} alkyl,
(aryl C_{1-6} alkyl$)_p$amino,
(aryl C_{1-6} alkyl$)_p$amino C_{1-6} alkyl,
arylcarbonyloxy,
aryl C_{1-6} alkylcarbonyloxy,
$(C_{1-6}$ alkyl$)_p$aminocarbonyloxy,
C_{1-8} alkylsulfonylamino,
arylcarbonylamino,
arylsulfonylamino,
C_{1-8} alkylsulfonylamino C_{1-6} alkyl,
arylsulfonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonylamino,
aryl C_{1-6} alkylsulfonylamino C_{1-6} alkyl,
C_{1-8} alkoxycarbonylamino,
C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
aryloxycarbonylamino C_{1-8} alkyl,
aryl C_{1-8} alkoxycarbonylamino,
aryl C_{1-8} alkoxycarbonylamino C_{1-8} alkyl,
C_{1-8} alkylcarbonylamino C_{1-6} alkyl,
arylcarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonylamino,
aryl C_{1-6} alkylcarbonylamino C_{1-6} alkyl,
aminocarbonylamino C_{1-6} alkyl,
arylaminocarbonylamino,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino,
$(C_{1-8}$ alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
$(aryl)_p$aminocarbonylamino C_{1-6} alkyl,
(aryl C_{1-8} alkyl$)_p$aminocarbonylamino,
(aryl C_{1-8} alkyl$)_p$aminocarbonylamino C_{1-6} alkyl,
aminosulfonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino,
$(C_{1-8}$ alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
$(aryl)_p$aminosulfonylamino C_{1-6} alkyl,
(aryl C_{1-8} alkyl$)_p$aminosulfonylamino,
(aryl C_{1-8} alkyl$)_p$aminosulfonylamino C_{1-6} alkyl,
C_{1-6} alkylsulfonyl,
C_{1-6} alkylsulfonyl C_{1-6} alkyl,
arylsulfonyl C_{1-6} alkyl,
aryl C_{1-6} alkylsulfonyl,
aryl C_{1-6} alkylsulfonyl C_{1-6} alkyl,
C_{1-6} alkylcarbonyl,
C_{1-6} alkylcarbonyl C_{1-6} alkyl,
arylcarbonyl C_{1-6} alkyl,
aryl C_{1-6} alkylcarbonyl,
aryl C_{1-6} alkylcarbonyl C_{1-6} alkyl,
C_{1-6} alkylthiocarbonylamino,
C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
arylthiocarbonylamino C_{1-6} alkyl,
aryl C_{1-6} alkylthiocarbonylamino,
aryl C_{1-6} alkylthiocarbonylamino C_{1-6} alkyl,
$(C_{1-8}$ alkyl$)_p$aminocarbonyl C_{1-6} alkyl,
$(aryl)_p$aminocarbonyl C_{1-6} alkyl,

(aryl C_{1-8} alkyl)$_p$aminocarbonyl,
(aryl C_{1-8} alkyl)$_p$aminocarbonyl C_{1-6} alkyl, and
C_{7-20} polycyclyl C_{0-8} alkylsulfonylamino,
wherein any of the alkyl groups of $R^7$and R^8 are either unsubstituted or substituted with one to three R^1 substituents,
and provided that each $R^7$and R^8 are selected such that in the resultant compound the carbon atom to which R^7 and R^8 are attached is itself attached to no more than one heteroatom;
R^9 is selected from the group consisting of
hydrogen,
C_{1-8} alkyl,
aryl,
aryl C_{1-8} alkyl,
C_{1-8} alkylcarbonyloxy C_{1-4} alkyl,
aryl C_{1-8} alkylcarbonyloxy C_{1-4} alkyl,
C_{1-8} alkylaminocarbonylmethylene, and
C_{1-8} dialkylaminocarbonylmethylene;
wherein each p is independently an integer from 0 to 2;
each r is independently an integer from 1 to 3;
each s is independently an integer from 0 to 3;
each t is independently an integer from 0 to 3; and
each v is independently an integer from 0 to 6;
and the pharmaceutically acceptable salts thereof.

6,040,312
FORMULATIONS AND METHODS OF REDUCING TOXICITY OF ANTINEOPLASTIC AGENTS

Frederick H. Hausheer, and Thomas J. Dodd, both of Boerne, Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

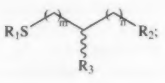
Division of application No. 08/954,678, Oct. 17, 1997, Pat. No. 5,919,816, which is a continuation-in-part of application No. 08/553,005, Nov. 3, 1995, Pat. No. 5,902,610, which is a continuation-in-part of application No. 08/338,379, Nov. 14, 1994, Pat. No. 5,789,000. This application Jan. 5, 1999, Appl. No. 225,957.

Int. Cl.^{7} A61K *31/44*

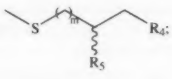
U.S. Cl. 514—283 **20 Claims**

1. A pharmaceutical formulation comprising a solution or suspension of i) an effective amount of a vinca alkaloid; and ii) a compound of the formula:

(I)



wherein:
R_1 is hydrogen, lower alkyl or



R_2 and R_4 are each individually $SO_3^-M^+$, $PO_3^{2-}M_2^{2+}$, or $PO_2S^{2-}M_2^{2+}$;
R_3 and R_5 are each individually hydrogen, hydroxy or sulfhydryl;
m and n are individually 0, 1, 2, 3 or 4, with the proviso that if m or n is 0, then R_3 is hydrogen; and
M is hydrogen or an alkali metal ion; or
a pharmaceutically acceptable salt thereof, and one or more pharmaceutically acceptable carriers, excipients or diluents.

6,040,313
WATER-SOLUBLE ESTERS OF CAMPTOTHECIN COMPOUNDS

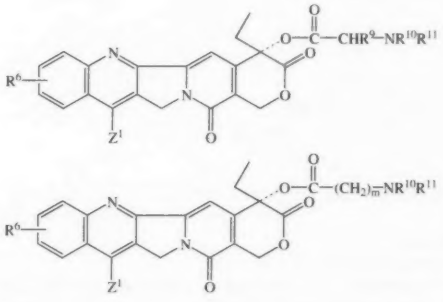
Monroe E. Wall, Chapel Hill, and Mansukh C. Wani, Durham, both of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Division of application No. 08/818,725, Mar. 14, 1997, Pat. No. 5,916,896, which is a division of application No. 08/277,642, Jul. 20, 1994, Pat. No. 5,646,159. This application Feb. 1, 1999, Appl. No. 241,076.

Int. Cl.^{7} A61K *31/44*

U.S. Cl. 514—283 **5 Claims**

1. A method of treating leukemia or solid tumors susceptible to CPT in a mammal in need thereof, comprising administering to said mammal an effective amount for treating said leukemia or solid tumors susceptible to CPT, a camptothecin ester having the structure:



wherein
R^6 is cyano, formyl, hydroxy, C_{1-8} alkoxy, nitro, amino, halogen, trifluoromethyl, aminomethyl, azido, amido, hydrazino, $OC(O)R^7$ or $OC(O)NR^7R^8$ where R^7 and R^8 are, independently hydrogen or C_{1-8} alkyl; and
Z^1 is H, C_{1-8} alkyl, $CH_2NR^1R^2$ where (a) R^1 and R^2 are, independently, hydrogen, C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl-C_{1-6} alkyl, C_{2-6} alkenyl, hydroxy-C_{1-6} alkyl, C_{1-6} alkoxy-C_{1-6} alkyl, (b) R^1 is hydrogen, C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl-C_{1-6} alkyl C_{2-6} alkenyl, hydroxy-C_{1-6} alkyl or C_{1-6} alkoxy-C_{1-6} alkyl and R^2 is —COR^3 where R^3 is hydrogen, C_{1-6} alkyl, perhalo-C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl-C_{1-6} alkyl, C_{2-6} alkenyl, hydroxy-C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkoxy-C_{1-6} alkyl, or (c) R^1 and R^2 taken together with the nitrogen atom to which they are attached form a saturated 3–7 membered heterocyclic ring which may contain a O, S or NR^4 group, where R^4 is hydrogen, C_{1-6} alkyl, perhalo-C_{1-6} alkyl, aryl, aryl substituted with one or more groups selected from the group consisting of C_{1-6} alkyl, halogen, nitro, amino, C_{1-6} alkylamino, perhalo-C_{1-6} alkyl, hydroxy-C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkoxy-C_{1-6} alkyl and —COR^5 where R^5 is hydrogen, C_{1-6}alkyl, perhalo-C_{1-6} alkyl, C_{1-6} alkoxy, aryl, and aryl substituted with one or more C_{1-6} alkyl, perhalo-C_{1-6} alkyl, hydroxy-C_{1-6} alkyl, or C_{1-6} alkoxy-C_{1-6} alkyl groups;
R^9 is the side chain of one or the naturally occurring α-amino acid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, proline, phenylalanine, tyrosine, tryptophan, lysine, arginine, histidine, aspartate, glutamate, asparagine, glutamine, cysteine and methionine;
R^{10} and R^{11} are, independently, hydrogen or C_{1-8} alkyl;
m is an integer of 1 to 6; and
n is an integer of 1 or 2; and pharmaceutically acceptable salts thereof.

6,040,314

BICYCLIC ISOTHIOUREA DERIVATIVES USEFUL IN THERAPY

James MacDonald, Pittsford, N.Y., assignor to Astra AB, Sodertalje, Sweden

Continuation of application No. 08/615,254, filed as application No. PCT/SE96/00162, Feb. 9, 1996, Pat. No. 5,786,364. This application May 7, 1998, Appl. No. 73,726.

Claims priority, application United Kingdom, Feb. 11, 1995, 9502669; Feb. 11, 1995, 9502670

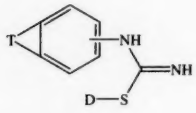
This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C07D** *217/00;* **C07C** *335/02;* **A61K** *31/47;31/155*

U.S. Cl. 514—307 **18 Claims**

1. A method of treatment or prophylaxis of diseases or conditions in which inhibition of NOS is beneficial which comprises administering to a person in need thereof a therapeutically effective amount of a compound of formula (1)

I



wherein

D represents alkyl C1 to 6

T represents a C_{3-5} saturated or unsaturated alkylene chain substituted by $(CH_2)_m$—NXY, —O—$(CH_2)_2$—NH— substituted by —$(CH_2)_m$—NXY; or —U—$(CH_2)_a$—N(X)—$(CH_2)_b$—;

U represents NH, O or CH_2;

a and b, which may be the same or different, represent an integer 0 to 3, provided that a+b is in the range 1 to 3;

X and Y, which may be the same or different, represent hydrogen, alkyl C1 to 6, or a group —$(CH_2)_nQ$,

or NXY together represents piperidinyl, pyrrolidinyl, morpholinyl, or tetrahydroisoquinolinyl;

Q represents phenyl optionally substituted by alkyl C1 to 6, alkoxy C1 to 6, trifluoromethyl, halogen, nitro or cyano;

m and n independently represents an integer 0 to 5;

or a pharmaceutically acceptable salt thereof.

6,040,315

ANTACID CO-POLYMER OF GUANIDINE AND POLYETHYLENIMINE

Charles E. Day, 1434 Sunbeam Rd., Leitchfield, Ky. 42754

Provisional application No. 60/064,419, Oct. 30, 1997. This application Oct. 29, 1998, Appl. No. 182,116.

Int. Cl.[7] **A01N** *43/42*

U.S. Cl. 514—310 **3 Claims**

1. A composition of matter which is a co-polymer of guanidine carbonate and polyethylenimine, wherein the mass ratio of guanidine carbonate to polyethylenimine is about 5:4.

6,040,316

3-ALKYL-3-PHENYL-PIPERIDINES

Michael Huai Gu Chen; Fu-Zon Chung, and Helen Tsenwhei Lee, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

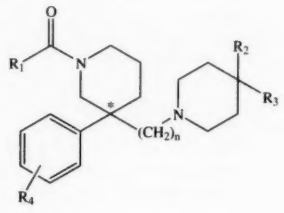
PCT No. PCT/US97/15443, § 371 Date Jan. 22, 1998, § 102(e) Date Jan. 22, 1998, PCT Pub. No. WO98/11090, PCT Pub. Date Mar. 19, 1998

Provisional application No. 60/026,385, Sep. 16, 1996. This PCT application Sep. 2, 1997, Appl. No. 983,584.

Int. Cl.[7] **A61K** *31/445;* **C07D** *401/06*

U.S. Cl. 514—316 **7 Claims**

1. A compound of formula



or a pharmaceutically acceptable salt thereof wherein:

R_1 is straight or branched alkyl of from 5 to 15 carbon atoms, aryl, or heteroaryl;

R_2 is hydrogen, hydroxy, amino, or thiol;

R_3 is arylsulfonylmethyl;

R_4 is from 1 to 4 groups each independently selected from halogen, lower alkyl, hydroxy, and lower alkoxy;

n is an integer of from 2 to 6; and the carbon atom of $(CH_2)_n$ group can be replaced by oxygen, nitrogen, or sulphur.

6,040,317

SULFONAMIDE FIBRINOGEN RECEPTOR ANTAGONISTS

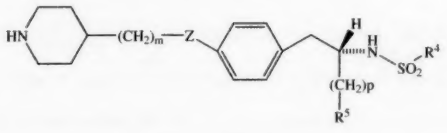
Mark E. Duggan, Narberth; Wasyl Halczenko, Hatfield; Melissa S. Egbertson, Ambler; George D. Hartman, Lansdale, and William L. Laswell, Perkasie, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of application No. 09/130,334, Aug. 6, 1998, Pat. No. 5,880,136, which is a division of application No. 08/861,545, May 22, 1997, Pat. No. 5,814,643, which is a continuation-in-part of application No. 07/750,647, Aug. 30, 1991, abandoned, which is a continuation-in-part of application No. 07/589,130, Sep. 27, 1990, abandoned. This application Dec. 28, 1998, Appl. No. 221,044.

Int. Cl.[7] **A61K** *31/445*

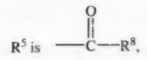
U.S. Cl. 514—317 **4 Claims**

1. A method for treating thrombus formation in a mammal in need thereof, comprising administering an effective amount of a compound of the structural formula

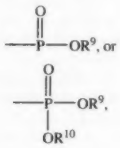


or a pharmaceutically acceptable salt thereof, wherein

R^4 is aryl, C_{1-10} alkyl, or C_{4-10} aralkyl, wherein aryl is phenyl, pyridyl, thienyl, tetrazole or oxazole;

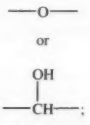


wherein R^8 is hydroxy or C_{1-10} alkyloxy,



wherein R^9 and R^{10} are selected from the group consisting of hydrogen, C_{1-10} alkyl and phenyl C_{1-4} alkyl;

Z is



p is zero or one; and m is an integer from two to six, in combination with an effective amount of fibrinolytic agent.

6,040,318

TRICYCLE SUBSTITUTED WITH AZAHETEROCYCLIC CARBOXYLIC ACIDS

Knud Erik Andersen, Smorum; Tine Krogh Jørgensen, Ølstykke; Rolf Hohlweg, Kvistgaard; Erik Fischer, Copenhagen S; Uffe Bang Olsen, Vallensbæk, all of Denmark; Zdenek Polivka, Prague, Czech Rep.; Karel Sindelar, Prague, Czech Rep., and Vladimir Valenta, Prague, Czech Rep., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

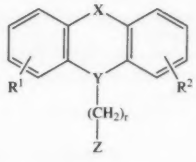
Provisional application No. 60/051,833, Jul. 7, 1997. This application Jun. 17, 1998, Appl. No. 98,579.

Claims priority, application Denmark, Jun. 25, 1997, 0751/97

Int. Cl.[7] **A01N** *43/40;43/36;* **C07D** *211/06*

U.S. Cl. 514—329 **17 Claims**

1. A compound of formula I



(I)

wherein R^1 and R^2 independently are hydrogen, halogen, trifluoromethyl, hydroxy, C_{1-6}-alkyl or C_{1-6}-alkoxy;

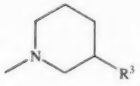
Y is >CH—CH_2— or >C=CH— wherein only the underscored atom participates in the ring system;

X is —$C(R^6R^7)$—, —CH_2CH_2—, —CH=CH—CH_2—, —CH_2—CH=CH—, —CH_2—(C=O)—, —(C=O)—CH_2—, —$CH_2CH_2CH_2$—, —CH=CH—, —$CH(R^{10})CH_2$—, —$CH_2CH(R^{10})$— or —(C=O)—, wherein R^6 and R^7 independently are hydrogen or C_{1-6}-alkyl; and wherein R^{10} is C_{1-6}-alkyl or phenyl;

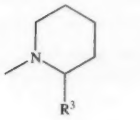
r is 1, 2 or 3; and

Z is selected from

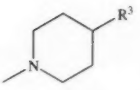
(a)



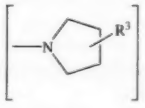
(b)



(c)



(d)



wherein R^3 is —$(CH_2)_p$COOH wherein p is 2, 3, 4, 5 or 6; or a pharmaceutically acceptable salt thereof.

6,040,319

PROCESS FOR SYNTHESIZING COX-2 INHIBITORS

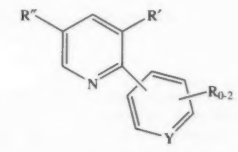
Edward G. Corley, Old Bridge; Ian W. Davies, Princeton; Robert D. Larsen, Bridgewater; Philip J. Pye, Guttenberg, and Kai Rossen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Provisional application No. 60/082,888, Apr. 24, 1998, Provisional application No. 60/085,668, May 15, 1998. This application Apr. 23, 1999, Appl. No. 298,127.

Int. Cl.[7] **A01N** *43/40;* **C07D** *211/30;211/78;211/72;213/62*

U.S. Cl. 514—334 **21 Claims**

1. A process for synthesizing a compound of the formula I:



I

wherein:

0-2 R groups are present;

each R, R' and R" independently represents C_{1-10}alkyl, C_{6-10}aryl, aralkyl, halo, —$S(O)_mH$, —$S(O)_mC_{1-6}$alkyl, —$S(O)_m$aryl, nitro, amino, C_{1-6}alkylamino, di-C_{1-6}alkylamino, —$S(O)_mNH_2$, —$S(O)_mNHC_{1-6}$alkyl, —$S(O)_mNHC(O)CF_3$ and cyano,

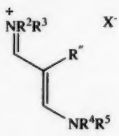
the alkyl and aryl groups, and the alkyl and aryl portions of aralkyl, —$S(O)_mC_{1-6}$alkyl, —$S(O)_m$aryl, C_{1-6}alkylamino, di-C_{1-6}alkylamino and —$S(O)_mNHC_{1-6}$alkyl being optionally substituted with 1–3 groups selected from —$S(O)_mC_{1-6}$alkyl, —CN, C_{1-6}alkoxy, amino, C_{1-6}alkylamino, di-C_{1-6}alkylamino, —$S(O)_mNH_2$, —$S(O)_mNHC_{1-6}$alkyl, —$S(O)_mNHC(O)CF_3$ and aryloxy;

Y is N;

and m is 0, 1 or 2,

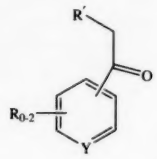
comprising reacting a compound of formula II:

II



wherein R^2 through R^5 each independently represent C_{1-6} alkyl, aryl or aralkyl, and X- represents a suitable counterion, with a compound of the formula III:

III



wherein R, R' and Y are as previously defined, in the presence of a base to produce a compound of formula I.

6,040,320

2-SUBSTITUTED IMIDAZOLES USEFUL IN THE TREATMENT OF INFLAMMATORY DISEASES

Scott A. Beers; Elizabeth A. Malloy, both of Flemington; Michael P. Wachter, Bloomsbury, and Wei Wu, Somerville, all of N.J., assignors to Ortho-McNeil Pharmaceutical, Inc., Raritan, N.J.

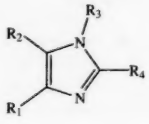
Provisional application No. 60/051,301, Jun. 30, 1997. This application Jun. 29, 1998, Appl. No. 106,698.

Int. Cl.[7] A61K *31/44;* **C07D** *401/04*

U.S. Cl. 514—341 **10 Claims**

1. A compound of Formula I

I



wherein:

one of R1 and R2 is phenyl optionally substituted by one or more of the members of the group consisting of C1–5 alkyl, halogen, nitro, trifluoromethyl and nitrile; the other is pyridyl optionally substituted by one or more of the members of the group consiting of C1–5alkyl and halogen;

R_3 is hydrogen, SEM, C_{1-5}alkoxycarbonyl, aryloxycarbonyl, aryiC_{1-5}alkyloxycarbonyl, arylC_{1-5}alkyl, phthalimidoC_{1-5} alkyl, aminoC_{1-5}alkyl, diaminoC_{1-5}alkyl, succinmidoC_{1-5} alkyl, C_{1-5}alkylcarbonyl, arylcarbonyl, C_{1-5}alylcarbonylC_{1-5} alkyl, aryloxycarbonylC_{1-5}alkyl, or

substituted arylC_{1-5}alkyl

wherein the aryl substituents are independently selected from one or more members of the group consisting of C_{1-5}alkyl, C_{1-5}alkoxy, halogen, amino, C_{1-5}alkylamino, and diC_{1-5}alkylamino;

R_4 is $(A)_n$-$(CH_2)_q$-X wherein:

A is sulfur;

n is 1;

q is 0–9;

X is selected from the group consisting of amino, C_{1-5}alkylamino, phthalimido, amido, phenylcarbonyl, C_{1-5}alkylaminocarbonyl, phenylaminocarbonyl, arylC_{1-5}alkylaminocarbonyl, C_{1-5}alkylsulfonyl, phenylsulfonyl,

substituted amido

wherein the carbonyl substituent is selected from the group consisting of C_{1-5}alkyl, phenyl, arylC_{1-5}alkyl, thienyl, furanyl, and naphthyl,

substituted phenylcarbonyl

wherein the phenyl substituents are independently selected from one or members of the group consisting of C_{1-5}alkyl, halogen and C_{1-5}alkoxy,

substituted C_{1-5}alkylsulfonyl

wherein the alkyl substituent is selected from the group consisting of hydroxy and phthalimido,

substituted phenylsulfonyl

wherein the phenyl substituents are independently selected from one or members of the group consisting of bromine, fluorine, chlorine, C_{1-5}alkoxy and trifluoromethyl,

with the proviso:

if A is sulfur and X is other than, C_{1-5}alkylaminocarbonyl, phenylarninocarbonyl, arylC_{1-5}alkylaminocarbonyl, C_{1-5}alkylsulfonyl or phenylsulfonyl, then q must be equal to or greater than 1;

and pharmaceutically acceptable salts thereof.

6,040,321

AMINOTHIAZOLE INHIBITORS OF CYCLIN DEPENDENT KINASES

Kyoung S. Kim, North Brunswick; S. David Kimball, East Windsor; Zhen-wei Cai, Somerville, all of N.J.; David B. Rawlins, Morrisville, Pa.; Raj N. Misra, Hopewell; Michael A. Poss, Lawrenceville, both of N.J.; Kevin R. Webster, Yardley, Pa.; John T. Hunt, Princeton, N.J., and Wen-Ching Han, Newtown, Pa., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

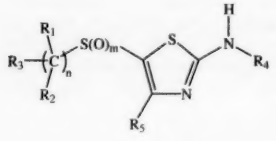
Provisional application No. 60/065,195, Nov. 12, 1997. This application Oct. 21, 1998, Appl. No. 176,239.

Int. Cl.[7] A61K *31/425;* **C07D** *417/12*

U.S. Cl. 514—369 **45 Claims**

1. A compound of the formula

(I)



and pharmaceutically acceptable salts thereof wherein:

R_1 and R_2 are independently hydrogen, fluorine or alkyl;

R_3 is aryl or heteroaryl;

R_4 is alkyl, cycloalkyl, aryl, cycloalkylalkyl, arylalkyl, heteroaryl, heteroarylalkyl, heterocycloalkyl, heterocycloalkylalkyl; or

CO-alkyl, CO-cycloalkyl, CO-aryl, CO-alkyl-cycloalkyl, CO-alkyl-aryl, CO-heteroaryl, CO-alkyl-heteroaryl, CO-heterocycloalkyl, CO-alkyl-heterocycloalkyl; or

CONH-alkyl, CONH-cycloalkyl, CONH-aryl, CONH-alkyl-cycloalkyl, CONH-alkyl-aryl, CONH-heteroaryl, CONH-alkyl-heteroaryl, CONH-heterocycloalkyl, CONH-alkyl-heterocycloalkyl; or

COO-alkyl, COO-cycloalkyl, COO-aryl, COO-alkyl-cycloalkyl, COO-alkyl-aryl, COO-heteroaryl, COO-alkyl-heteroaryl, COO heterocycloalkyl, COO-alkyl-heterocycloalkyl; or

SO_2-cycloalkyl, SO_2-aryl, SO_2-alkyl-cycloalkyl, SO_2-alkyl-aryl, SO_2-heteroaryl, SO_2-alkyl-heteroaryl, SO_2-heterocycloalkyl, SO_2-alkyl-heterocycloalkyl; or C(NCN)NH-alkyl, C(NCN)NH-cycloalkyl, C(NCN)NH-aryl, C(NCNNH)-alkyl-cycloalkyl, C(NCN)NH-alkyl-aryl,

C(NCN)NH-heteroaryl, C(NCN)NH-alkyl-heteroaryl, C(NCN)NH-heterocycloalkyl, C(NCN)NH-alkyl-heterocylcoalkyl; or

$C(NNO_2)$NH-alkyl, $C(NNO_2)$NH-cycloalkyl, $C(NNO_2)$NH-aryl, $C(NNO_2)$NH-alkyl-cycloalkyl, $C(NNO_2)$NH-alkyl-aryl, $C(NNO_2)$NH-heteroaryl, $C(NNO_2)$NH-alkyl-heteroaryl, $C(NNO_2)$NH-heterocyloalkyl, $C(NNO_2)$NH-alkyl-heterocycloalkyl; or

C(NH)NH-alkyl, C(NH)NH-cycloalkyl, C(NH)NH-aryl, C(NH)NH-alkyl-cycloalkyl, C(NH)NH-alkyl-aryl, C(NH)NH-heteroaryl, C(NH)NH-alkyl-heteroaryl, C(NH)NH-heterocycloalkyl, C(NH)NH-alkyl-heterocycloalkyl; or

C(NH)NHCO-alkyl, C(NH)NHCO-cycloalkyl, C(NH)NHCO-aryl, C(NH)NHCO-alkyl-cycloalkyl, C(NH)NHCO-alkyl-aryl, C(NH)NHCO-heteroaryl, C(NH)NHCO-alkyl-heteroaryl, C(NH)NHCO-heterocylcloalkyl, C(NH)NHCO-alkyl-heterocycloalkyl; or

$C(NOR_6)$NH-alkyl, $C(NOR_6)$NH-cycloalkyl, $C(NOR_6)$NH-aryl, $C(NOR_6)$NH-alkyl-cycloalkyl, $C(NOR_6)$NH-alkyl-aryl, $C(NOR_6)$NH-heteroaryl, $C(NOR_6)$NH-alkyl-heteroaryl, $C(NOR_6)$NH-heterocylcoalkyl, $C(NOR_6)$NH-alkyl-heterocycloalkyl;

R_5 is hydrogen or alkyl;

R_6 is hydrogen, alkyl, cycloalkyl, aryl, cycloalkylakyl, arylalkyl, heteroaryl, heteroarylalkyl, heterocycloalkyl or heterocycloalkylalkyl;

m is an integer of 0 to 2; and

n is an integer of 1 to 3.

6,040,322

MEDICAMENTS FOR AMELIORATING ENDOTHELIAL CELL ACTIVATION

Luciano Cominacini, Verona, Italy, assignor to Glaxo Wellcome Inc., Research Triangle Park, N.C.

PCT No. PCT/GB97/01521, § 371 Date Dec. 9, 1998, § 102(e) Date Dec. 9, 1998, PCT Pub. No. WO97/46238, PCT Pub. Date Dec. 11, 1997

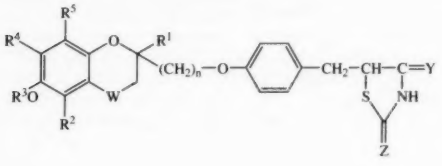
PCT Filed Jun. 6, 1997, Appl. No. 194,950

Claims priority, application United Kingdom, Jun. 7, 1996, 9611947

Int. Cl.[7] **A61K** *31/425*

U.S. Cl. 514—370 **7 Claims**

1. A method for the treatment of an animal, including man, suffering from inappropriate endothelial cell activation, which method comprises administration of a therapeutically effective amount of a compound of formula (I):



in which:

R^1 and R^2 are the same or different and each represents a hydrogen atom or a C_1–C_5 alkyl group;

R^3 represents a hydrogen atom, a C_1–C_6 aliphatic acyl group, a (C_5–C_7 cycloalkane) carbonyl group, an aromatic acyl group which is a benzoyl or naphthoyl group optionally with one or more nitro, amino, alkylamino, dialkylamino, alkoxy, halo, alkyl or hydroxy substituents, a heterocyclic acyl group having one or more oxygen, sulphur or nitrogen hetero atoms and with 4 to 7 ring atoms, an optionally halo-substituted phenylacetyl or phenylpropionyl group, a cinnamoyl group, a (C_1–C_6 alkoxy) carbonyl group or a benzoyloxycarbonyl group;

R^4 and R^5 are the same or different and each represents a hydrogen atom, a C_1–C_5 alkyl group or a C_1–C_5 alkoxy group, or R^4 and R^5 together represent a C_1–C_4 alkylenedioxy group;

n is 1, 2 or 3;

W represents the —CH_2–, >CO or >CH—OR^6 group (in which R^6 represents any one of the atoms or groups defined for R^3 and may be the same as or different from R^3); and

Y and Z are the same or different and each represents an oxygen atom or an imino (=NH) group;

or a pharmaceutically acceptable salt thereof.

6,040,323

PHOSPHATASE INHIBITORS AND METHODS OF USE THEREOF

John S. Lazo, Pittsburgh; Robert L. Rice, Glenshaw; April Cunningham, Harleysville, and Peter Wipf, Pittsburgh, all of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

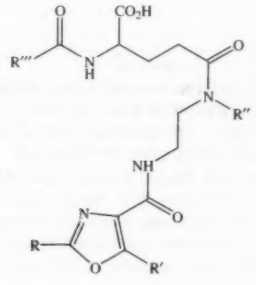
Division of application No. 08/688,530, Jul. 30, 1996, Pat. No. 5,700,821. This application Aug. 22, 1997, Appl. No. 917,454.

Int. Cl.[7] **A61K** *31/42*

U.S. Cl. 514—374 **3 Claims**

1. A method of inhibiting cell proliferation comprising introducing into cells a proliferation-inhibiting amount of a compound having the formula:

I



wherein R is phenyl, R' is phenyl, R" is benzyl, and R"' is n-C_9H_{19}.

6,040,324

PROPHYLACTIC OR THERAPEUTIC DRUG FOR RENAL DISEASES

Kohei Nishikawa, Kyoto; Yumiko Shibouta, Suita, and Keiji Kubo, Minoo, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Continuation of application No. 08/229,930, Apr. 19, 1994, abandoned. This application Dec. 8, 1998, Appl. No. 207,043.

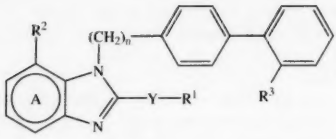
Claims priority, application Japan, Apr. 22, 1993, 5-095942

This patent is subject to a terminal disclaimer.

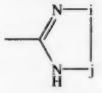
Int. Cl.[7] **A61K** *31/41*

U.S. Cl. 514—381 **13 Claims**

1. A method for the prophylaxis or treatment of sclerosis of the glomeruli in a mammal in need thereof, comprising the step of administering, to a mammal having diabetic nephropathy or glomerulonephritis, a pharmaceutically effective amount of a compound or salt thereof represented by formula:



wherein R^1 stands for H or a lower (C_1–C_4) alkyl; R^2 stands for a group represented by the formula —CO—D" where D" stands for hydroxy or a lower (C_1–C_4) alkoxy group, the alkyl moiety of which optionally is substituted with hydroxy, amino, halogen, lower (C_2–C_6) alkanoyloxy, lower (C_4–C_7) cycloalkanoyloxy, lower (C_1–C_6) alkoxycarbonyloxy, lower (C_3–C_7) cycloalkoxycarbonyloxy or lower (C_1–C_4) alkoxy; R^3 stands for a tetrazolyl, carboxyl group or a group represented by the formula



where i stands for —O— or —S— and j stands for >C=O, >C=S or $>S(O)_m$ where m is 0, 1 or 2; n stands for 1 or 2; ring A stands for a benzene ring; Y stands for O, N(H) or S.

6,040,325

TRIAZOLE DERIVATIVE OR SALT THEREOF PREPARATION PROCESS THEREOF, AND PHARMACEUTICAL CONTAINING SAID COMPOUND AS AN EFFECTIVE INGREDIENT

Sunao Takeda, Ichihara; Yasushi Kaneko, Narita; Minoru Tokizawa, Narita; Hiromichi Eto, Narita; Kazuya Ishida, Narita; Kazunori Maebashi, Narashino; Masaru Matsumoto, Inba-gun; Takemitsu Asaoka, and Susumu Sato, both of Narita, all of Japan, assignors to SSP Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1999, Appl. No. 235,320

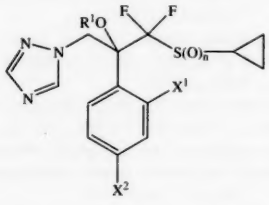
Claims priority, application Japan, Feb. 2, 1998, 10-020690

Int. Cl.[7] A61K *31/41;* **C07D** *249/08*

U.S. Cl. 514—383 **4 Claims**

1. A triazole derivative represented by the following formula (1):

(1)



wherein R^1 represents a hydrogen atom, a lower alkyl group or an aralkyl group, X^1 and X^2 are the same or different and each independently represents a hydrogen atom, a halogen atom or a halogenoalkyl group and n stands for an integer of 0 to 2, or a pharmacologically acceptable salt thereof.

6,040,326

3-DEOXYGLUCOSONE PRODUCTION INHIBITOR

Nigishi Hotta, Aichi, and Hiroki Fujisawa, Hyogo, both of Japan, assignors to Nippon Zoki Pharmaceuticals Co., Ltd., Osaka, Japan

Filed Dec. 24, 1997, Appl. No. 997,872

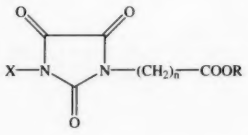
Claims priority, application Japan, Dec. 27, 1996, 8-357874

Int. Cl.[7] A61K *31/415*

U.S. Cl. 514—386 **12 Claims**

1. A method for inhibiting the production of 3-deoxyglucosone for the treatment or prevention of effects of aging, a disease selected from atherosclerosis, coronary heart disease, cerebrovascular disease, senile cataract, or a disease induced by deposition into tissues or sclerosis or denaturization of crosslinked protein, or complications associated with diabetes mellitus comprising determining the concentration of 3-deoxyglucosone in the plasma of a patient and administering to a patient in need of such treatment or prevention a pharmaceutically effective amount of a 3-deoxyglucosone inhibitor containing at least one parabanic acid derivative represented by the formula (I) or pharmaceutically acceptable salt thereof:

(I)



wherein

R is hydrogen or lower alkyl;

X is hydrogen, alkyl, cycloalkyl, lower alkylcycloalkyl, phenyl or phenylalkyl which is optionally substituted with lower alkyl, lower alkoxy, nitro and/or halogen; and

n is an integer of from 1 to 4.

6,040,327

BENZIMIDAZOLE, BENZOXAZOLE AND BENZOTHIAZOLE COMPOUNDS

Guillaume De Nanteuil, Suresnes; Bernard Portevin, Elancourt; Jacqueline Bonnet, Paris, and Armel Fradin, Neuilly sur Seine, all of France, assignors to Adir Et Compagnie, Courbevoie, France

Filed Jul. 22, 1998, Appl. No. 120,487

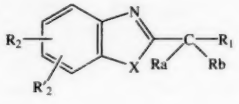
Claims priority, application France, Jul. 30, 1997, 97.09710

Int. Cl.[7] A61K *31/415;* **C07D** *403/04*

U.S. Cl. 514—394 **16 Claims**

1. A compound selected from those of formula (I):

(I)



wherein:

R_1 represents hydroxy, linear or branched (C_1–C_6)alkoxy (optionally substituted by aryl), trihalomethyl, cyano, sulpho, amino substituted by one or more, identical or different, linear or branched (C_1–C_6)alkyl, optionally substituted aryl, acyl, arylsulphonyl and/or alkylsulphonyl), mercapto, linear or branched (C_1–C_6)alkylthio, linear or branched (C_1–C_6)trialkylammonium, aryloxy, arylthio wherein aryl is an aromatic group containing no hetero atoms, arylaminocarbonyl, arylcarbonylamino, arylsulphonylamino, arylaminosulphonyl, arylureido, arylthioureido, arylsulphonyl, arylsulphonyloxy, (C_3–C_7)-cycloalkyloxy, (C_3–C_7)cycloalkylthio, (C_6–C_8)bicycloalkyloxy (optionally substituted by aryl), or

(C_6–C_8)bicycloalkylthio (optionally substituted by aryl), it being understood that each aryl is optionally substituted,

Ra and Rb, which may be identical or different, represent hydrogen, hydroxy, or linear or branched (C_1–C_6)alkyl (optionally substituted by aryl),

X represents NR (wherein R represents hydrogen or linear or branched (C_1–C_6)alkyl),

R_2 represents imidazolyl, benzimidazol-1-yl, naphthyl, pyridyl, thiazolyl, oxazolyl, benzothiazolyl, benzoxazolyl, pyrrolyl, furyl, thienyl, imidazopyridinyl, triazolyl, or tetrazolyl, each of those groups being optionally substituted by one or more, identical or different, halogen, linear or branched (C_1–C_6)alkyl, linear or branched (C_1–C_6)trihaloalkyl, linear or branched (C_1–C_6)alkoxy, nitro, cyano, carboxy, linear or branched (C_1–C_6)alkoxycarbonyl, hydroxy, amino (optionally substituted by one or more, identical or different, linear or branched (C_1–C_6)alkyl, acyl, alkylsulphonyl, and/or arylsulphonyl), optionally-substituted phenyl, and/or optionally-substituted bicycloalkyl,

R'_2 represents hydrogen or optionally-substituted aryl,

the term "aryl group" being understood to mean a mono- or bi-cyclic aromatic group optionally containing 1 to 4 hetero atoms selected from nitrogen, sulphur, and oxygen, and the term "optionally substituted" as applied to the aryl, phenyl and bicycloalkyl groups meaning a substitution of those groups by one or more, identical or different, halogen atoms, linear or branched (C_1–C_6)alkyl, linear or branched (C_1–C_6)trihaloalkyl, linear or branched (C_1–C_6)alkoxy (optionally substituted by a carboxy or alkoxycarbonyl group), hydroxy, nitro, cyano, amino (optionally substituted by one or more, identical or different, linear or branched (C_1–C_6)alkyl, acyl, alkylsulphonyl and/or arylsulphonyl groups), carboxy, linear or branched (C_1–C_6)alkoxycarbonyl, hydroxyaminocarbonyl, alkylsulphonylamino, arylsulfonylamino, alkylsulphonylaminocarbonyl, arylsulphonylaminocarbonyl, optionally substituted phenyl, and/or optionally substituted bicycloalkyl groups,

their isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

6,040,328

AROMATIC DISELENIDES AND SELENOSULFIDES, THEIR PREPARATION AND THEIR USES, MORE PARTICULARLY THEIR THERAPEUTICAL USE

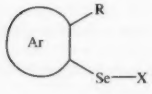
Catherine Tailhan-Lomont, Boissise le Roi; Irène Erdelmeier, Paris; Marc Moutet, Bagneux; Jean Chaudiere, Saint Maur des Fosses, and Jean-Claude Yadan, Montreuil, all of France, assignors to Oxis International S.A., Portland, Oreg.

Division of application No. 08/997,669, Dec. 23, 1997, Pat. No. 5,973,009. This application Aug. 31, 1999, Appl. No. 387,593. Claims priority, application France, Dec. 27, 1996, 96 16103

Int. Cl.[7] **A61K** *31/415;31/38;31/335;* **C07D** *277/04;333/32*

U.S. Cl. 514—398 **15 Claims**

1. Organoselenium compounds of general formula (I):



(I)

in which:

R=hydrogen; —CR_1R_2)—A—B;

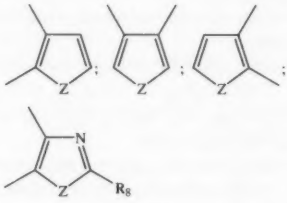
R_1=lower alkyl; optionally substituted aryl; optionally substituted lower aralkyl;

R_2=lower alkyl:optionally substituted aryl:optionally substituted lower aralkyl;

A=CO; (CR_3R_4)n;

B represents NR_5R_6; $N^+R_5R_6R_7Y^-$; OR_5; SR_5;

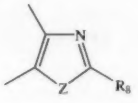
Ar=an optionally substituted radical of formula:



in which Z represents O; S; NR_5; when R=—CR_1R_2)—A—B

or

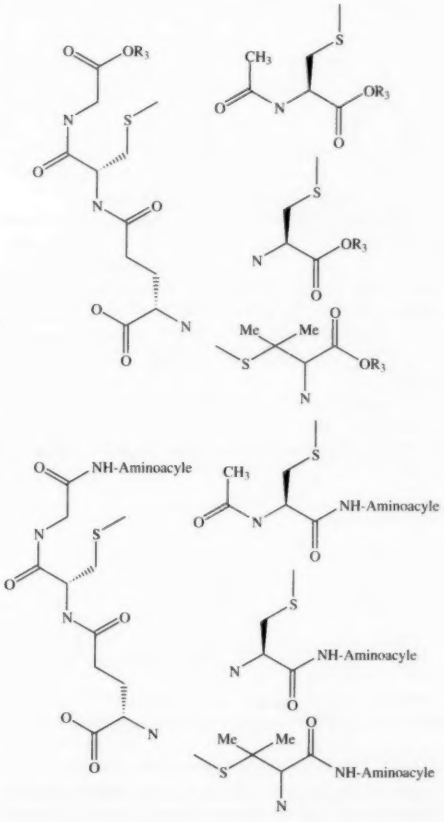
Ar=a radical of formula



in which Z=O; S; NR_5; when R is hydrogen;

X=Ar(R)—Se—; -S-glutathione ; —S—N-acetylcysteine; -S-cysteine

-S-penicillamine; -S-albumin; -S-glucose;



R_3=hydrogen; lower alkyl; optionally substituted aryl, optionally substituted lower aralkyl;

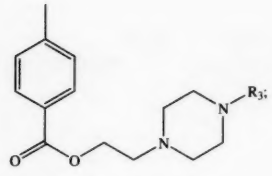
R_4=hydrogen; lower alkyl; optionally substituted aryl:optionally substituted lower aralkyl;

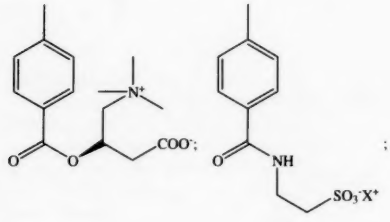
R_5=hydrogen; lower alkyl; optionally substituted aryl:optionally substituted lower aralkyl; optionally substituted heteroaryl; optionally substituted lower heteroaralkyl; CO(lower alkyl); CO(aryl); SO_2 (lower alkyl); SO_2(aryl);

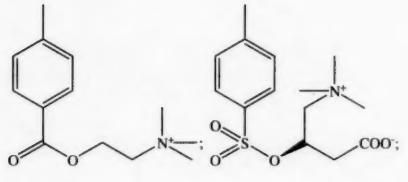
R_6=hydrogen; lower alkyl; optionally substituted aryl; optionally substituted lower aralkyl; optionally substituted heteroaryl; optionally substituted lower heteroaralkyl;

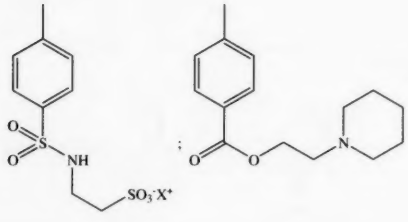
R_7=hydrogen; lower alkyl; optionally substituted aryl:optionally substituted lower aralkyl; optionally substituted heteroaryl; optionally substituted lower heteroaralkyl;

R_8=hydrogen; lower alkyl; optionally substituted aryl; optionally substituted lower aralkyl; optionally substituted heteroaryl; optionally substituted lower heteroaralkyl; trifluoromethyl;









n=0 or 1;

X^+ represents the cation of a pharmaceutically acceptable base;

Y^- represents the anion of a pharmaceutically acceptable acid; and their salts of pharmaceutically acceptable acids or bases.

6,040,329

SUBSTITUTED INDAZOLE ANALOGS

Anthony Marfat, Mystic, Conn., assignor to Pfizer Inc, New York, N.Y.

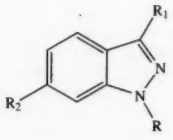
Provisional application No. 60/020,385, Jun. 25, 1996. This application Jun. 5, 1997, Appl. No. 869,358.

Int. Cl.[7] **C07D** *403/04;* **A61K** *31/415*

U.S. Cl. 514—405 **12 Claims**

1. A compound of Formula (I):

(I)



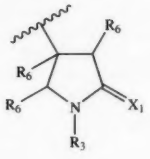
or a pharmaceutically acceptable salt thereof, wherein:

R is H; $(C_1–C_6)$ alkyl; or $—(CH_2)_m(C_3–C_7)$ cycloalkyl, where m is 0 to 2; wherein said R groups are optionally substituted by one or more substituents independently selected from the group consisting of halo; hydroxy; $(C_1–C_5)$ alkyl; $(C_2–C_5)$ alkenyl; $(C_1–C_5)$ alkoxy; $(C_3–C_6)$ cycloalkoxy; trifluoromethyl; nitro; $—CO_2R_{10}$; $—C(=O)NR_{10}R_{11}$; $—NR_{10}R_{11}$; and $—SO_2NR_{10}R_{11}$;

R_1 is H; $(C_1–C_7)$ alkyl; $(C_2–C_3)$ alkenyl; phenyl; $(C_3–C_7)$ cycloalkyl; or $(C_3–C_7)$ cycloalkyl$(C_1–C_2)$ alkyl; wherein said alkyl, alkenyl and phenyl R_1 groups are optionally substituted by 1 to 3 substituents independently selected from the group consisting of methyl; ethyl; trifluoromethyl; and halo;

R_2 is a 2-oxo-4-pyrrolyl group of Formula $(Ia)_1$:

$(Ia)_1$



wherein:

X_1 is O or S;

R_3 is H; hydroxy; $(C_1–C_4)$ alkoxy; $—CHR_7(O)_q(CH_2)_mA$ where q is 0 or 1, m is 0 to 2, and A is phenyl optionally substituted by 1 or 2 R_{14} groups or by 1 R_{15} group; and

R_6 is in each instance independently selected from the group consisting of H or halo one of $—R_6$ represents cyano; R_{13}; cyclopropyl optionally substituted by R_9; $—OR_{10}$; $—CH_2OR_{10}$; $—NR_{10}R_{12}$; $—CH_2NR_{10}R_{12}$; $—C(O)OR_{10}$; $—C(O)NR_{10}R_{12}$; $—CH=CR_9R_{10}$; $—C(O)CR_9$; and $—C(=Z_3)H$;

wherein with respect to the above substituent groups:

$R_7$is H; or $—C(O)R_8$;

R_8 is independently selected from the group consisting of $—OR_{10}$; $—NR_{10}R_{12}$; and R_{13};

R_9 is in each instance independently selected from the group consisting of H; halo; and $(C_1–C_4)$ alkyl optionally substituted by 1 to 3 fluorines;

R_{10} and R_{11} are in each instance independently selected from the group consisting of H; and $(C_1–C_4)$ alkyl;

R_{12} is in each instance independently selected from the group consisting of $—OR_{10}$; and R_{10};

R_{13} is $(C_1–C_4)$ alkyl;

R_{14} is independently selected from the group consisting of halo; nitro; cyano; $—NR_{10}R_{16}$; $—NR_{16}R_{12}$; $—C(=Z_3)R_8$, $—S(O)_mR_{13}$ where m is 0 to 2; $—OR_{12}$; $—OC(O)NR_{10}R_{12}$; $—C(NR_{12})NR_{10}R_{12}$; $—C(NR_{10})SR_{13}$; $—OC(O)CH_3$, $—C(NCN)NR_{10}R_{12}$; $—C(S)NR_{10}R_{12}$; $—NR_{12}C(O)R_{17}$; and $—C(O)R_{17}$;

R_{15} is independently H; or (C_1–C_4) alkyl optionally substituted by 1 to 3 fluorines;

R_{16} is in each instance independently selected from the group consisting of H; R_{13}; —C(O)R_{13}; —C(O)C(O)R_8; —C(O)$NR_{10}R_{12}$; —S(O)$_m R_{13}$ where m is 0 to 2; —C(NCN)SR_{13}; —C(NCN)R_{13}; —C(NR_{12})R_{13}; —C(NR_{12})SR_{13}; and —C(NCN)$NR_{10}R_{12}$;

R_{17} is independently R_{13}; or —C(O)R_{13}; and

Z_3 is in each instance independently selected from the group consisting of O; NR_{12}; NOR_{10}; N(CN); $C(CN)_2$; $CR_{10}NO_2$; $CR_{10}C(O)OR_{13}$; $CR_{10}C(O)NR_{10}R_{11}$; C(CN)NO_2; C(CN)C(O)OR_{13}; and C(CN)C(O)$NR_{10}R_{11}$.

6,040,330

PHARMACEUTICAL FORMULATIONS OF TAXANES

Fredrick H. Hausheer, Boerne; Dhanabalan Murali, and Peddaiahgari Seetharamulu, both of San Antonio, all of Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

Filed Jan. 8, 1999, Appl. No. 226,968

Int. Cl.^{7} A61K *31/40*

U.S. Cl. 514—408 **8 Claims**

1. A pharmaceutical formulation comprising a taxane and N-methylpyrrolidin-2-one.

6,040,331

NERVE CELL PROTECTIVE AGENTS

Ichiro Yamamoto; Manabu Itoh; Masato Shimojo; Yasunobu Yumiya; Takafumi Mukaihira, and Yasushige Akada, all of Tokyo, Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP97/01828, § 371 Date Jan. 30, 1998, § 102(e) Date Jan. 30, 1998, PCT Pub. No. WO97/45410, PCT Pub. Date Dec. 4, 1997

PCT Filed May 29, 1997, Appl. No. 11,260

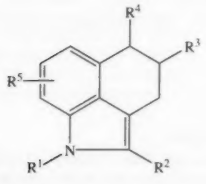
Claims priority, application Japan, May 30, 1996, 8-158985; Nov. 28, 1996, 8-332764

Int. Cl.^{7} A61K *31/40;31/425;* **C07D** *209/90;417/00;403/00*

U.S. Cl. 514—411 **13 Claims**

1. A compound represented by the following formula (I) or a salt thereof:

(I)



where R^1 represents a hydrogen atom or a straight-chained, branched or cyclic alkyl group having 1–4 carbon atoms which may be substituted by any group selected from the group consisting of one carboxyl group, one alkoxycarbonyl group having 1–4 carbon atoms and one hydroxyl group; R represents a phenyl group which may be mono- or disubstituted by any group selected from the group consisting of a halogen atom, an alkyl group having 1–4 carbon atoms which may be substituted by one hydroxyl group, an alkoxyl group having 1–4 carbon atoms which may be substituted by one hydroxyl group, an optionally protected hydroxyl group, a nitro group, an optionally protected amino group, an acetylamino group, a cyano group, an optionally protected carboxyl group, an alkoxycarbonyl group having 1–4 carbon atoms, a carbamoyl group and a trifluoromethyl group; either one of R^3 and R^4 represents a hydrogen atom and the other represents a group represented by the following formula (II):

—NR^6R^7 (II)

(where R^6 and R^7 each represent a hydrogen atom, a phenyl group, a benzyl group, an alkyl group having 1–4 carbon atoms which may be monosubstituted by any group selected from the group consisting of one hydroxyl group, one amino group, one carboxyl group and one alkoxycarbonyl group having 1–4 carbon atoms, a formyl group, an alkanoyl group having 1–4 carbon atoms which may be monosubstituted by an amino group, or a benzoyl group which may be monosubstituted by an amino group; R^6 and R^7 may form a pyrrolidine, piperidine, morpholine, or piperazine ring together with the nitrogen atom to which they are bound, provided that the nitrogen atom at the 4-position of the piperazine ring where a hydrogen atom is substituted may be substituted by any group selected from the group consisting of an oxalo group, and alkoxyoxalyl group having 1–4 carbon atoms, an alkanoyl group having 1–4 carbon atoms which may be substituted by one hydroxyl group and an alkyl group having 1–4 carbon atoms); R^5 represents a hydrogen atom, a halogen atom, an alkyl group having 1–4 carbon atoms, an optionally protected hydroxyl group, a cyano group, a nitro group or an alkoxyl group having 1–4 carbon atoms which may be monosubstituted by a group selected from the group consisting of one carboxyl group, one alkoxycarbonyl group having 1–4 carbon atoms and one hydroxyl group; when R^4 is a hydrogen atom, R^6 and R^7 is not a formyl group, an alkanoyl group having 1–4 carbon atoms which may be monosubstituted by an amino group, or a benzoyl group which may be monosubstituted by an amino group; and a pharmaceutically acceptable carrier thereof.

6,040,332

AMINO CERAMIDE-LIKE COMPOUNDS AND THERAPEUTIC METHODS OF USE

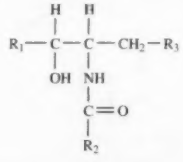
James A. Shayman, and Norman S. Radin, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of application No. 08/708,574, Sep. 5, 1996, Provisional application No. 60/004,047, Sep. 20, 1995. This application Jun. 26, 1997, Appl. No. 882,773.

Int. Cl.^{7} A61K *31/40*

U.S. Cl. 514—428 **5 Claims**

1. A method for treating a patient having a microbial or viral infection comprising the step of administering to the patient a therapeutically effective amount of a compound selected from the group consisting of compounds of the formula:



where R_1 is an aromatic structure, an alicyclic structure, a branched aliphatic structure or a linear aliphatic group having 5 to 15 carbons;

R_2 is an aliphatic chain having 9 to 18 carbons; and

R_3 is pyrrolidino;

and functional homologues, isomers and pharmaceutically acceptable salts thereof.

6,040,333

DIETARY SUPPLEMENTS

Sherry D. Jackson, New York, N.Y., assignor to Energetics, Inc., New York, N.Y.

Continuation-in-part of application No. 08/688,448, Jul. 30, 1996, Pat. No. 5,654,011. This application Jun. 12, 1997, Appl. No. 873,792.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *31/35;35/78*

U.S. Cl. 514—456 **6 Claims**

1. A method of supplementing the dietary needs of a peri-menopausal and/or menopausal woman said method comprising administering to the woman a dietary supplementing amount of phytoestrogen per day, said dietary supplementing amount being less than 20 mg.

6,040,334

USE OF INHIBITORS OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE AS A MODALITY IN CANCER THERAPY

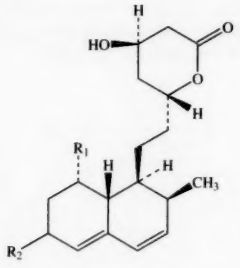
Charles Myers, Rockville; Jane Trepel, Bethesda; Won Ki Kang, Rockville; Luke Whitesell, and Len Neckers, both of Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of application No. 07/882,223, May 13, 1992, abandoned. This application Oct. 20, 1994, Appl. No. 330,865.

Int. Cl.[7] A61K *31/35*

U.S. Cl. 514—460 **5 Claims**

1. A method for treating an adenocarcinoma selected from the group consisting of an adenocarcinoma of the prostate, an adenocarcinoma of the breast, an adenocarcinoma of the stomach, a pulmonary adenocarcinoma, and an adenocarcinoma of the colon in a mammal, comprising oral administration of an effective amount of a compound of the formula I



wherein R_1 is selected from a group consisting of a hydrogen atom, a hydroxy group, a 2-methylbutyryloxy group (—OCOCH(CH_3)CH_2CH_3) and a 2,2-dimethylbutyryloxy group (—OCOC(CH_3)2CH_2CH_3) and R_2 is selected from a group consisting of a hydrogen atom and a methyl group.

6,040,335

THERAPEUTICS FOR THROMBOCYTOPENIA

Masayuki Saitoh; Yasuo Kitajima, both of Osaka; Norio Iwasawa, Shiga-ken; Kenju Miura; Munetada Haruyama, both of Osaka, and Junko Hashino, Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

PCT No. PCT/JP96/03008, § 371 Date Jul. 31, 1997, § 102(e) Date Jul. 31, 1997, PCT Pub. No. WO97/14704, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 17, 1996, Appl. No. 849,887

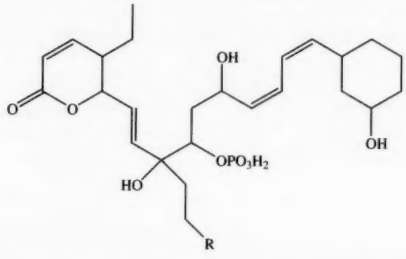
Claims priority, application Japan, Oct. 17, 1995, 7-268644

Int. Cl.[7] A61K *31/365;* **C07D** *309/02*

U.S. Cl. 514—460 **13 Claims**

1. A compound represented by the general formula (I):

(I)



(where R is a group —NHCHR_1R_2, —N(CHR_1R_2)$_2$, —N(CHR_1R_2)CHR_3R_4, —N$^+$(CHR_1R_2)$_3$, —N$^+$(CHR_1R_2)$_2$CHR_3R_4 or —N$^+$(CHR_1R_2)(CHR_3R_4)CHR_5R_6 (where R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, are each a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or an aralkyl group, or an alkyl, alkenyl, aryl or aralkyl group which is substituted by at least one substituent selected from the group consisting of a halogen atom, a hydroxyl group, a lower alkoxy group, a lower alkylacyloxy group, a lower alkylacyl group, a lower alkoxycarbonyl group, a nitro group, and a cyano group, with CHR_1R_2, CHR_3R_4 or CHR_5R_6, optionally forming a cyclic alkyl group, provided that R is not —NHCH_3, and that when R is —N(CHR_1R_2)CHR_3R_4, —N$^+$(CHR_1R_2)$_2$CHR_3R_4 or —N$^+$(CHR_1R_2)(CHR_3R_4)CHR_5R_6, CHR_1R_2, CHR_3R_4 and CHR_5R_6 are different groups)) or a pharmacologically acceptable salt thereof.

6,040,336

PROSTANE DERIVATIVES AND THE COMBINATION THEREOF WITH ANTIBIOTICS IN THE TREATMENT OF BACTERIAL INFECTIONS

Peter Scholz; Jörg Weber, and Klemens Angstwurm, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP96/03481, § 371 Date Apr. 23, 1998, § 102(e) Date Apr. 23, 1998, PCT Pub. No. WO97/06806, PCT Pub. Date Feb. 27, 1997

PCT Filed Aug. 6, 1996, Appl. No. 11,457

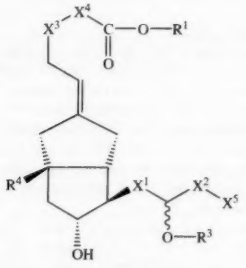
Claims priority, application Germany, Aug. 11, 1995, 195 30 884

Int. Cl.[7] A61K *31/34;31/21;31/19*

U.S. Cl. 514—468 **18 Claims**

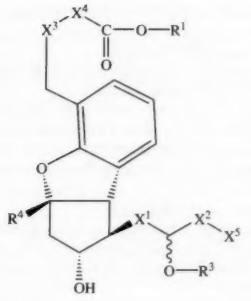
1. A method for treating bacterially induced meningitis, comprising administering an effective amount of a compound of formula I or Ia

formula I



and

formula Ia



wherein

X^1 is a $—CH_2—CH_2—$, trans —CH═CH— or —C≡C— group,

X^2 is a linear or branched saturated hydrocarbon chain having from 1 to 6 carbon atoms,

X^3 is an —O— or $—CH_2—$ group,

X^4 is a $—CH_2—$ or $(—CH_2)_3—$ group,

X^5 is a hydrogen atom or a $—C≡C—R^2$ group,

R^1 is a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms or a phenyl group,

R^2 is a linear or branched, saturated or unsaturated hydrocarbon chain having from 1 to 6 carbon atoms,

R^3 is a hydrogen atom, an acyl radical having from 1 to 4 carbon atoms or a benzyl radical, and

R^4 is a hydrogen atom or a methyl group,

wherein the $O—R^3—$ group is in the α- or β-configuration,

or a salt thereof with a physiologically tolerable base when R^1 represents a hydrogen atom.

6,040,337

5-DEMETHOXYFUMAGILLOL DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Chung Hong, II, East Amherst, N.Y.; Jung Woo Kim, Seoul, Rep. of Korea; Sang Joon Lee, Kyunggi-do, Rep. of Korea; Soon Kil Ahn, Seoul, Rep. of Korea; Nam Song Choi, Seoul, Rep. of Korea; Ryung Kee Hong, Seoul, Rep. of Korea; Hyoung Sik Chun, Seoul, Rep. of Korea; Seung Kee Moon, Seoul, Rep. of Korea, and Hong Woo Lee, Kyunggi, Rep. of Korea, assignors to Chong Kun Dang Corporation, Seoul, Rep. of Korea

Filed May 13, 1999, Appl. No. 311,777

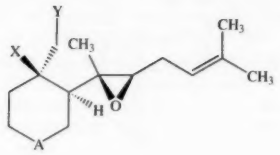
Claims priority, application Rep. of Korea, May 15, 1998, 98-17637

Int. Cl.[7] A61K *31/335;* **C07D** *301/32;303/08*

U.S. Cl. 514—475 **6 Claims**

1. A compound, or a pharmaceutically acceptable salt thereof, represented by Formula 1:

1



wherein

a) —X is —OH; and

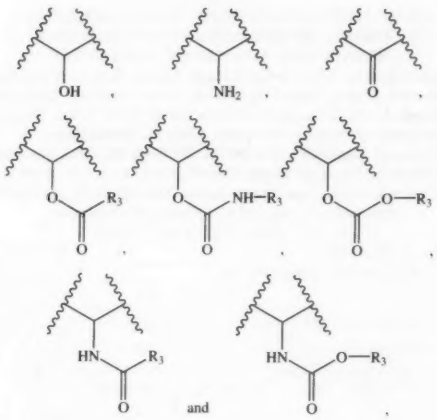
—Y is chosen from halogen and,

wherein

R_1 and R_2 are individually chosen from —H and substituted or unsubstituted lower alkyl, with the proviso that R_1 and R_2 are not both —H; and

Z^- is a counter ion; or —X and —Y taken together form an oxirane ring; and

b) —A— is chosen from



wherein

R_3 is chosen from substituted or unsubstituted lower alkyl, substituted or unsubstituted alkanoyl, substituted or unsubstituted aryl, substituted or unsubstituted arylalkyl and arylalkanoyl.

6,040,338

N,N-BIS(SULFONYL)HYDRAZINES USEFUL AS ANTINEOPLASTIC AGENTS

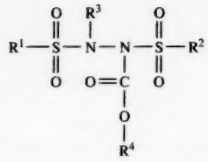
Alan C. Sartorelli, Woodbridge; Krishnamurthy Shyam, Hamden; Philip G. Penketh, Hamden, and Shu-Hui Chen, Hamden, all of Conn., assignors to Yale University, New Haven, Conn.

Filed Nov. 3, 1997, Appl. No. 963,182

Int. Cl.[7] A61K *31/27*

U.S. Cl. 514—482 **11 Claims**

1. A compound of the formula



wherein

R^1 is selected from the group consisting of lower alkyl groups having 1–6 carbon atoms, substituted or unsubstituted aryl groups, and unsaturated alkyl groups having 2–6 carbon atoms;

R^2 is selected from the group consisting of lower alkyl groups having 1–6 carbon atoms, substituted or unsubstituted aryl groups, and unsaturated alkyl groups having 2–6 carbon atoms;

R^3 is a substituted or unsubstituted lower alkyl group having 1–6 carbons; and

R^4 is selected from the group consisting of substituted or unsubstituted lower alkyl groups having 1–6 carbon atoms, substituted or unsubstituted aryl groups, and unsaturated alkyl groups having 2–6 carbon atoms.

6,040,339

UREA DERIVATIVES HAVING ACAT INHIBITORY ACTIVITY, THEIR PREPARATION AND THEIR THERAPEUTIC AND PROPHYLACTIC USE

Akira Yoshida; Kozo Oda; Takashi Kasai; Kousei Shimada; Hiroshi Kogen; Ichiro Hayakawa; Sadao Ishihara; Teiichiro Koga; Eiichi Kitazawa, and Taro Tokui, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Division of application No. 08/715,589, Sep. 18, 1996, Pat. No. 5,880,147. This application May 28, 1998, Appl. No. 86,402. Claims priority, application Japan, Sep. 18, 1995, 7-238042

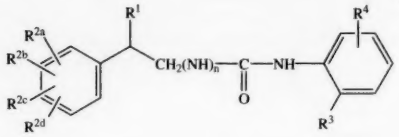
This patent is subject to a terminal disclaimer.

Int. Cl.[7] **A61K** *31/27;* **C07C** *233/08*

U.S. Cl. 514—485 **65 Claims**

1. A compound of formula (I):

(I)



wherein:

R^1 represents an alkyl group having from 1 to 12 carbon atoms;

R^{2a}, R^{2b}, R^{2c} and R^{2d} are the same or different and each represents:

a hydrogen atom;

an alkyl group having from 1 to 12 carbon atoms;

an alkyl group which has from 1 to 4 carbon atoms and which is substituted by from 1 to 5 fluorine atoms;

an alkyl group which has from 1 to 12 carbon atoms and which is substituted by an unprotected or protected hydroxy group;

a group of formula —(C=O)—B^1

wherein B^1 represents a hydrogen atom, an alkyl group having from 1 to 12 carbon atoms, a group of formula —O—D,

wherein D represents a hydrogen atom or a carboxy-protecting group,

a group of formula —NR^aR^b,

wherein R^a and R^b are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 12 carbon atoms,

a nitro group;

a group of formula —NR^cR^d,

wherein R^c represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms and R^d represents an alkyl group having from 1 to 4 carbon atoms;

a hydroxy group or a protected hydroxy group;

an alkoxy group having from 1 to 10 carbon atoms;

a group of formula —O—B^2—(C=O)—B^1,

wherein B^1 is as defined above and B^2 represents an alkylene group having from 1 to 5 carbon atoms;

a group of formula —O—B^2—B^3,

wherein B^2 is as defined above and B^3 represents an alkoxy group having from 1 to 6 carbon atoms, an alkylthio group having from 1 to 6 carbon atoms, an alkylsulfinyl group having from 1 to 6 carbon atoms, an alkylsulfonyl group having from 1 to 6 carbon atoms or an alkylsulfonylarmino group having from 1 to 6 carbon atoms;

a cyano group;

a group of formula —CH=N—OB^4,

wherein B^4 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

an alkylthio group having from 1 to 6 carbon atoms;

an alkylsulfinyl group having from 1 to 6 carbon atoms;

an alkylsulfonyl group having from 1 to 6 carbon atoms;

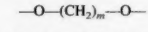
an alkylsulfonylamino group having from 1 to 6 carbon atoms;

a group of formula —$SO_2NR^eR^f$,

wherein R^e represents a hydrogen atom or an alkyl group which has from 1 to 6 carbon atoms and R^f represents an alkyl group which has from 1 to 6 carbon atoms;

or a halogen atom; or

R^{2a} and R^{2b} are adjacent to each other and together represent a group of formula

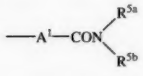


wherein m is an integer of from 1 to 3;

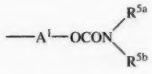
R^3 represents an alkyl group having from 1 to 6 carbon atoms;

R^4 represents a group of formula (II), (III), (IV), (V), (VI), (VII), (VIII) or (IX):

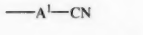
(II)



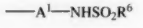
(III)



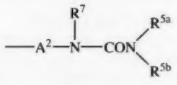
(IV)



(V)



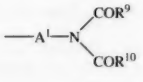
(VI)



(VII)

(VIII)

(IX)



wherein:

A^1 represents a single bond, an alkylene group having from 1 to 6 carbon atoms or an alkenylene group having from 2 to 6 carbon atoms;

A^2 represents an alkyene group having from 1 to 6 carbon atoms or an alkenylene group having from 2 to 6 carbon atoms;

A^3 represents a single bond, an alkylene group having from 1 to 6 carbon atoms or an alkenylene group having from 2 to 6 carbon atoms;

R^{5a} and R^{5b} are the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms or a group of formula $—A^4R^{5c}$,

wherein A^4 represents a single bond, an alkylene group having from 1 to 6 carbon atoms or an alkenylene group having from 2 to 6 carbon atoms;

R^{5c} represents an alkoxy group having from 1 to 4 carbon atoms;

R^6 represents an alkyl group having from 1 to 4 carbon atoms or a phenyl group which is substituted or unsubstituted;

R^7 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

R^8 represents an alkyl group having from 1 to 12 carbon atoms, an alkyl group having from 1 to 12 carbon atoms substituted by an unprotected or protected carboxy group, an alkyl group having from 1 to 12 carbon atoms substituted by from 1 to 5 fluorine atoms, an alkoxy group having from 1 to 10 carbon atoms, an aralkoxy group in which an alkoxy group having from 1 to 4 carbon atoms is substituted by a carbocyclic aryl group having from 6 to 10 ring carbon atoms, a phenyl group which is substituted or unsubstituted;

R^9 and R^{10} are the same or different and each represents an alkyl group having from 1 to 4 carbon atoms;

or a ortho-phenylene group; and

n represents 0;

or pharmaceutically acceptable salts thereof.

6,040,340

IMPLANTATION RATES AFTER IN VITRO FERTILIZATION, TREATMENT OF INFERTILITY AND EARLY PREGNANCY LOSS WITH A NITRIC OXIDE DONOR ALONE OR IN COMBINATION WITH PROGESTERONE, AND A METHOD FOR CONTRACEPTION WITH NITRIC OXIDE INHIBITORS

Krzysztof Chwalisz, Berlin, Germany, and Robert E. Garfield, Friendswood, Tex., assignors to Schering Aktiengesellschaft, Berlin, Germany, and The Board of Regents, Univ. of Texas System, Austin, Tex.

Filed May 7, 1996, Appl. No. 646,518

Int. Cl.[7] A61K *31/21*

U.S. Cl. 514—509 **27 Claims**

1. A method for improvement of implantation rates in a female mammal after in vitro fertilization which comprises administering to an afflicted female an amount of nitric oxide synthase substrate, a nitric oxide donor, or both, effective to raise the blood level of circulating L-arginine to at least about 50– 5000 μmolar above the normally 50–1000 μmolar circulating levels and, optionally, also a progestin or, both of an estrogen and a progestin, in amounts effective to increase the pregnancy rates.

6,040,341

COMPOUNDS AND THEIR COMPOSITIONS HAVING ANTI-INFLAMMATORY AND ANTI-THROMBOTIC ACTIVITIES

Piero Del Soldato, and Francesco Sannicolo', both of Milan, Italy, assignors to Nicox S.A., Paris, France

PCT No. PCT/EP36/04696, § 371 Date Apr. 29, 1998, § 102(e) Date Apr. 29, 1998, PCT Pub. No. WO97/16405, PCT Pub. Date May 9, 1997

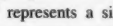
PCT Filed Oct. 29, 1996, Appl. No. 66,344

Claims priority, application Italy, Oct. 31, 1995, MI95A2263

Int. Cl.[7] A61K *31/21*

U.S. Cl. 514—509 **7 Claims**

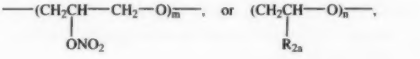
1. A compound of the formula:



or salts, wherein;

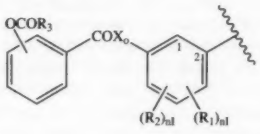
A=R(COX)$_t$, wherein t=0 or 1;

X=O, NH, NR_{1c}, wherein R_{1c} is a linear or branched C_1–C_{10} alkyl group



wherein m and n are an integer from 1 to 6; wherein R_{2a} is H or CH_3; and wherein the linking with X_1 can be in any position of the ring;

R is:



wherein:

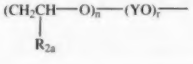
X_0=X;

R_1 is $OCOR_3$; wherein R_3 is methyl, ethyl, linear or branched C_3–C_5 alkyl, or the residue of an etherocycle with only one ring having 5 or 6 atoms which can be aromatic, partially or completely hydrogenated, containing one or more etheroatoms selected independently among O, N and S;

R_2 is hydrogen, hydroxy, halogen, linear or branched C_{1-4} alkyl, linear or branched C_1–C_4 alkoxyl; a linear or branched C_1–C_4, perflouroalkyl, nitro, amino, mono- or dialkylamine with C_{1-4} alkyl; or R_1 and R_2 together are dioxymethylene group;

n_l is an integer 0 or 1;

X_1 in the formula $A—X_1—NO_2$, is a bivalent connecting bridge selected from the group consisting of —YO— where Y is a linear or branched C_{1-20} alkylene, or a substituted or unsubstituted C_{5-7} cycloalkylene; and



wherein n is an integer from 1 to 6, R_{2a} is an defined above; Y is as defined above, and r= 0 or 1;

with the proviso that when X=NH, then Y is only ethylene and R_2 is hydrogen; and with the proviso that R_1 cannot be $OCOR_3$, in position 2 when R_3 is methyl.

6,040,342

RETINOYLOXY (ALKYL-SUBSTITUTED) METHYL BUTYRATES USEFUL FOR THE TREATMENT OF CANCER AND OTHER PROLIFERATIVE DISEASES

Ada Rephaeli, North Caldwell, N.J., and Abraham Nudelman, Rehovot, Israel, assignors to Bar-Ilan University, Ramat-Gan, and Kupat Holim Health Institution of the General Federation of Labor, Tel Aviv, both of Israel

Continuation-in-part of application No. 08/306,422, Sep. 16, 1994, Pat. No. 5,710,176. This application Jul. 2, 1996, Appl. No. 674,481.

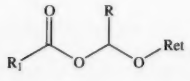
This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61K *31/225;* **C07C** *403/10*

U.S. Cl. 514—548 **19 Claims**

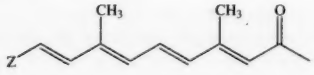
1. A compound of Formula (I):

Formula (I)



wherein:

Ret is selected from the group consisting of retinoyl group, a therapeutically-active retinoid carboxyl group, a group represented by the formula



and retinoids which are C20 and C22 desmethyl vinylogs of said groups, wherein Z is a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group or a cyclohexenyl group, and said phenyl or naphthyl group can be substituted with from 0 to 5 substitutents selected from the group consisting of halo, hydroxy, alkyl, alkyoxy, amino, cyano or carbalkoxy, and wherein double bonds in the polyene chain of any of said groups can have a cis or trans configuration;

R is H or saturated or unsaturated group of C_1 to C_5 alkyl;

R_1 is ethyl, n-propyl or isopropyl; and

pharmaceutically acceptable salts thereof, with the proviso that when Ret is 13-cis-retinoyl and R_1, is n-propyl, then R cannot be H or C_1 to C_5 alkyl.

6,040,343

REMEDY FOR KERATOCONJUNCTIVAL DISEASES

Katsuhiko Nakata, Sakurai; Masatsugu Nakamura, Nara, and Takashi Hamano, Ashiya, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP97/00081, § 371 Date Jul. 17, 1998, § 102(e) Date Jul. 17, 1998, PCT Pub. No. WO97/26872, PCT Pub. Date Jul. 31, 1997

PCT Filed Jan. 17, 1997, Appl. No. 101,110

Claims priority, application Japan, Jan. 22, 1996, 8-008243

Int. Cl.[7] A61K *31/22;31/23*

U.S. Cl. 514—549 **14 Claims**

1. A therapeutic agent for keratoconjunctiva diseases containing gefarnate as an active ingredient together with an ophthalmic carrier.

6,040,344

FORMOTEROL PROCESS

Yun Gao, Southborough, Mass.; Robert Hett, Aarau, Switzerland; Kevin Q. Fang, Wellesley, Mass.; Stephen A. Wald, Sudbury, Mass.; Martin P. Redmon, Marlborough, Mass., and Chris Hugh Senanayake, Shrewsbury, Mass., assignors to Sepracor Inc., Marlborough, Mass.

Continuation-in-part of application No. 08/747,592, Nov. 12, 1996, abandoned. This application May 21, 1998, Appl. No. 83,010.

Int. Cl.[7] A61K *31/16;* **C07C** *233/03*

U.S. Cl. 514—554 **10 Claims**

1. Crystalline R,R-formoterol L-(+)-tartrate.

6,040,345

BENZOYLPHENYLUREA INSECTICIDES AND METHODS OF USING THEM TO CONTROL COCKROACHES

Ronald E. Hackler, Indianapolis, and Kathryn E. Lawrence, Crawfordsville, both of Ind., assignors to Dow AgroSciences LLC, Indianapolis, Ind.

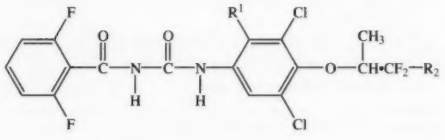
Provisional application No. 60/029,748, Nov. 8, 1996. This application Oct. 31, 1997, Appl. No. 962,565.

Int. Cl.[7] A01N *31/17*

U.S. Cl. 514—594 **8 Claims**

1. A compound of formula (I):

(I)



wherein R^1 is H or F and R^2 is CF_3 or CF_2CF_3.

6,040,346

USE OF L-CARNITINE AND DERIVATIVES FOR REDUCING CERAMIDE LEVELS AND POTENTIATING ANTIRETROVIRAL DRUGS

Sonia Moretti, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., and Mendes s.r.l., both of Rome, Italy

PCT No. PCT/IT96/00146, § 371 Date Feb. 3, 1998, § 102(e) Date Feb. 3, 1998, PCT Pub. No. WO97/05864, PCT Pub. Date Feb. 20, 1997

PCT Filed Jul. 19, 1996, Appl. No. 202

Claims priority, application Italy, Aug. 3, 1995, RM95A0544

Int. Cl.[7] A01N *33/12;43/04*

U.S. Cl. 514—642 **6 Claims**

1. A method of potentiating the anti-retroviral activity of AZT effective in the treatment of a patient with normal serum and intracellular levels of carnitine and acetylcarnitine and suffering from AIDS, comprising administering to a patient in need thereof:

a) AZT; and

b) an enhancement agent selected from the group consisting of L-carnitine, an alkanoyl L-carnitine wherein the alkanoyl group has 2–6 carbon atoms, and pharmacologically acceptable salts, or mixtures thereof, wherein the enhancement agent and the AZT are administered for at least 4 weeks in amounts effective to increase TCD4 lymphocyte levels.

6,040,347

TREATMENT OF SEBORRHOEA/CUTANEOUS DISORDERS WITH OCTOXYGLYCEROL

Sylvie Cupferman, Paris, and Jean-Pierre Laugier, Antony, both of France, assignors to Societe L'Oreal S.A., Paris, France

PCT No. PCT/FR97/02039, § 371 Date Aug. 4, 1998, § 102(e) Date Aug. 4, 1998, PCT Pub. No. WO98/22081, PCT Pub. Date May 28, 1998

PCT Filed Nov. 13, 1997, Appl. No. 101,623

Claims priority, application France, Nov. 15, 1996, 96 13980

Int. Cl.[7] A61K *31/08*

U.S. Cl. 514—723 **39 Claims**

1. A method for treating seborrhoea of thc skin and/or of the scalp and/or cutaneous disorders associated with seborrhoea comprising applying to the affected area of a subject in need of said treatment a cosmetic composition comprising an effective amount of octoxyglycerol in a cosmetically acceptable medium therefor.

6,040,348

COMPOSITION BASED ON PROPYLENE POLYMERS FOR EXPANDED GRANULES, PROCESS FOR OBTAINING IT AND ITS USE

Emmanuel Delaite, Braine-le-Comte; Jean Charlier, Ceroux-Mousty, and Giuliano Bertozzi, Brussels, all of Belgium, assignors to Solvay Poloyolefins Europe-Belgium (Societe Anonyme), Brussels, Belgium

Filed Jul. 23, 1998, Appl. No. 121,103

Claims priority, application Belgium, Jul. 24, 1997, 09700642

Int. Cl.[7] C08J *9/00*

U.S. Cl. 521—59 **14 Claims**

1. Composition for expanded granules, which comprises, per 100 parts by weight,

from 60 to 90 parts by weight of a propylene homopolymer (A) having a melt flow index (MFI), measured according to the ASTM D 1238 (1986) standard, under a load of 2.16 kg at 230° C. and expressed in g/10 min, ranging from 0.1 to 20 and

from 40 to 10 parts by weight of a propylene random copolymer (B) containing from 3 to 20 mol % of ethylene and/or of an α-olefin having from 4 to 6 carbon atoms, the MFI of which ranges from 25 to 3000 g/10 min.

6,040,349

PRODUCTION OF RIGID POLYURETHANES FOAMS WITH REDUCED DENSITY

Gottfried Knorr, Schwarzheide; Udo Rotermund, Ortrand; Eva Baum, Schwarzheide; Holger Seifert, Hüde, and Werner Wiegmann, Rahdem, all of Germany, assignors to BASF Aktiegesellschaft, Ludwigshafen, Germany

Filed Mar. 11, 1998, Appl. No. 38,388

Claims priority, application Germany, Mar. 11, 1997, 197 09 868

Int. Cl.[7] C08G *18/32*

U.S. Cl. 521—131 **15 Claims**

1. A process for producing rigid polyurethane foams having reduced density comprising reacting

a) organic and/or modified organic polyisocyanates with

b) at least one higher-molecular-weight compound having at least two reactive hydrogen atoms and, optionally,

c) low-molecular-weight chain extenders and/or crosslinkers

in the presence of

d) blowing agent

e) catalysts and, optionally,

f) other auxiliaries and/or additives,

wherein the blowing agent (d) comprises a mixture of cyclopentane, at least one compound which is homogeneously miscible with cyclopentane selected from the group consisting of alkanes and alkenes having 3 or 4 carbon atoms in the molecule, and carbon dioxide produced from water and isocyanate, and wherein the higher-molecular-weight compound (b) having at least two reactive hydrogen atoms comprise polyethers which contain aromatics and nitrogen.

6,040,350

EPOXY RESIN TYPE COMPOSITION FOR STIFFENING VEHICLE BODY AND METHOD FOR STIFFENING VEHICLE BODY

Takayuki Fukui, Kanagawa-ken, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa-ken, Japan

Filed Aug. 26, 1998, Appl. No. 140,314

Claims priority, application Japan, Aug. 26, 1997, 9-229865

Int. Cl.[7] C08L *63/00*

U.S. Cl. 521—135 **18 Claims**

1. An epoxy resin type composition for stiffening a vehicle body, comprising:

epoxy resin;

a powdery methacrylate type polymer in an amount of 2 to 45 parts by weight relative to 100 parts by weight of said epoxy resin;

a thermally active hardening agent for epoxy resin in an amount of 1 to 20 parts by weight relative to 100 parts by weight of said epoxy resin;

a thermally decomposable organic type foaming agent in an amount of 0.5 to 20 parts by weight relative to 100 parts by weight of said epoxy resin; and

a mixture of an inorganic salt with a shape of a predetermined aspect ratio and a granular inorganic salt, said mixture being in an amount of 50 to 200 parts by weight relative to 100 parts by weight of said epoxy resin wherein a mixing ratio of said granular inorganic salt is 0 to 50% by weight relative to a total amount of said mixture.

6,040,351

FOAM RUBBER COMPOSITION AND A MOLDED PRODUCT OF FOAM RUBBER

Tomoaki Okita, Kasugai; Katsumi Nakashima, Ichinomiya; Takashi Mizushima, Nagoya, and Takeru Wadaki, Ichihara, all of Japan, assignors to Toyoda Gosei Co. Ltd., Aichi-ken, Japan

Filed Jun. 5, 1998, Appl. No. 90,996

Claims priority, application Japan, Jun. 6, 1997, 9-149026

Int. Cl.[7] C08J *9/10*

U.S. Cl. 521—140 **22 Claims**

1. A foam rubber composition comprising:

(A) a low-molecular ethylene-propylene-5-ethylidene-2norbornene terpolymer having a Mooney viscosity (ML_{1+4} at 100° C.) of about 20 to about 40, an ethylene/propylene ratio (C2/C3) by weight of about 65/35 to about 50/50, an iodine value of about 20 to about 30, and a Q value (Mw/Mn) not exceeding 3 as determined by gel permeation chromatography;

(B) a high-molecular ethylene-propylene-5-ethylidene-2-norbornene terpolymer having a Mooney viscosity (ML_{1+4} at 100° C.) of about 100 to about 300, an ethylene/propylene ratio (C2/C3) by weight of about 65/35 to about 50/50, an iodine value of about 20 to about 30 and a Q value (Mw/Mn) of about 6 to about 10;

(C) a vulcanizing system agent containing sulfur as a vulcanizer, and zinc carbamate and sulfenamide as accelerators; and

(D) a foaming agent containing N, N'-dinitrosopentamethylenetetramine and urea;

said composition having an (A)/(B) ratio by weight of about 45/55 to about 15/85, and containing about 3.0 to about 6.0 parts by weight of (C) and about 3.0 to about 8.0 parts by weight of (D) relative to a total of 100 parts by weight of (A) and (B).

6,040,352

FREE RADICAL POLYMERIZATION PROCESS USING A MONOCHROMATIC RADIATION SOURCE

Robin E. Wright, Inver Grove Heights, Minn., assignor to 3M Innovative Properties Company, Saint Paul, Minn.

Filed Jun. 11, 1998, Appl. No. 96,005

Int. Cl.[7] C08F *2/46*

U.S. Cl. 522—2 **33 Claims**

1. A method of preparing an adhesive composition comprising exposing a free-radically polymerizable pre-adhesive composition to a monochromatic radiation source having a peak intensity at a wavelength falling within the range of about 250 nanometers to about 600 nanometers to polymerize said pre-adhesive composition and form said adhesive composition.

6,040,353

RADIATION CURABLE SILICONE COMPOSITIONS

Shedric Oneal Glover; Chi-long Lee, and Wen-hong Tong, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 25, 1998, Appl. No. 199,623

Int. Cl.[7] C08F *2/50;* **C08J** *3/28;* **C08L** *83/07;83/06*

U.S. Cl. 522—15 **20 Claims**

1. A radiation curable silicone composition comprising:

(A) a vinyl ether functional silicon compound;

(B) a cationic photoinitiator;

(C) a free radical photoinitiator; and

(D) dodecylphenol.

6,040,354

IMPRESSION COMPOUND WITH A SILICON BASE AND WAX ADMIXTURE

Heijo Hübner, Wörthsee; Dierk Lübbers, and Wolfgang Mühlbauer, both of Hamburg, all of Germany, assignors to Ernst Mühlbauer KG, Germany

PCT No. PCT/EP96/00723, § 371 Date Aug. 21, 1997, § 102(e) Date Aug. 21, 1997, PCT Pub. No. WO96/26246, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 21, 1996, Appl. No. 894,573

Claims priority, application Germany, Feb. 21, 1995, 195 05 896; May 16, 1995, 195 17 962

Int. Cl.[7] A61K *6/10*

U.S. Cl. 523—109 **44 Claims**

1. A composition, comprising at least one wax and at least one compound selected from the group consisting of polysiloxanes, polysulphides and aziridine-free polyethers, wherein said at least one wax is not hydrogenated castor oil, paraffin wax or microwax, wherein said composition is made by heating a mixture of said at least one wax and said at least one compound to a temperature above the melting point of said at least one wax, dispersing said mixture to provide an emulsion, and shock cooling said emulsion.

6,040,355

FOUNDRY CURING SYSTEM

Kenneth R Kurple, 9533 Springborn Rd., Anchorville, Mich. 48004

Filed Jul. 1, 1998, Appl. No. 108,623

Int. Cl.[7] B22C *1/20*

U.S. Cl. 523—139 **4 Claims**

1. A process for producing a sand core which has been previously coated with resin, said resin being mixture of an isocyanate and a component selected from the group consisting of lignin, liquid protein, starches, epoxy ester, polyester polyols, polyether polyols, and epoxy resins, said process further utilizing heated air as a catalyst, said heated air having a temperature in the range of 180° F. to 1000° F., comprising the steps of:

filling a mold with said sand which has been previously coated with a resin, said resin being a mixture of an isocyanate and a component selected from the group consisting of lignin, liquid protein, starches, epoxy ester, polyester polyols, polyether polyols, and epoxy resins; and,

heating said sand core with air having a temperature in the range of 180° F. to 1000° F.

6,040,356

DURABLE GRAVURE INK AND USES OF THE SAME

Masahiro Kanki; Mutsuhiro Kawano, and Takashi Matano, all of Shinjuku-Ku, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

PCT No. PCT/JP97/02999, § 371 Date May 11, 1998, § 102(e) Date May 11, 1998, PCT Pub. No. WO98/08905, PCT Pub. Date Mar. 5, 1998

PCT Filed Aug. 28, 1997, Appl. No. 51,886

Claims priority, application Japan, Aug. 28, 1996, 8-243979; Dec. 3, 1997, 9-347309

Int. Cl.[7] C08K *5/3415;5/3432;* **C08L** *27/06;27/12;75/08*

U.S. Cl. 523—160 **5 Claims**

1. A durable gravure ink comprising:

(A) a high weather resistant pigment selected from the group consisting of quinacridone, perylene and anthracene series red pigments, isoindolinone series yellow pigments, Prussian blue, fast sky blue, and a black pigment comprising a mixture of said red, yellow and blue pigments;

(B) a high alkali resistant pigment selected from the group consisting of polyazo red pigments, polyazo yellow pigments, indanthrene blue, and aniline black; and

(C) a high weather and high alkali resistant binder selected from the group consisting of a vinyl chloride-vinyl acetate copolymer, a cyclized rubber, a polyurethane comprising an acrylic polyol or polyether polyol and a polyisocyanate, nitrocellulose, an epoxy resin, polyvinyl fluoride, polyvinylidene fluoride, and mixtures thereof,

wherein, (1) if said ink is red, said pigments comprise a mixture of at least one red pigment of (A) and at least one red pigment of (B), (2) if said ink is yellow, said pigments comprise a mixture of at least one yellow pigment of (A) and at least one yellow pigment of (B), (3) if said ink is blue, said pigments comprise a mixture of at least one blue pigment of (A) and at least one blue pigment of (B), and (4) if said ink is black, said pigment comprises a mixture of at least one black pigment of (A) and at least one black pigment of (B).

6,040,357

METHOD OF MAKING A RADIATION-CURABLE INK COMPOSITION, RADIATION-CURABLE INK COMPOSITION AND RIBBON ASSEMBLY

Edward J. Murphy, Arlington Heights, Ill.; Jeffrey Classey, Denver, N.C., and David M. Szum, Elmhurst, Ill., assignors to DSM N.V., Heerlen, Netherlands

Filed May 28, 1998, Appl. No. 84,918

Int. Cl.[7] C09D *11/00;11/02;* **C03C** *17/34;* **G02B** *6/04;1/12*

U.S. Cl. 523—160 **29 Claims**

1. An improved radiation-curable ink composition which when coated and suitably cured on a coated optical glass fiber provides an ink coating having a substantially uniform color, the improved ink composition comprising:

a radiation-curable carrier system containing at least one radiation-curable monomer or oligomer; and

at least one pigment dispersed in said radiation-curable carrier system in an amount sufficient to provide a color which is visible without magnification, said pigment being substantially insoluble in said radiation-curable carrier system whereby the particulate shape of said pigment is substantially retained in said radiation-curable carrier system, and said pigment having a particle size which substantially avoids pigment induced microbending of an optical glass fiber coated with said ink coating.

6,040,358
INK JET INKS CONTAINING LINEAR POLYMER ADDITIVES

Loretta Ann Grezzo Page, Newark; Harry Joseph Spinelli, and Waifong Liew Anton, both of Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1996, Appl. No. 774,991
Int. Cl.[7] C09D *11/10*
U.S. Cl. 523—161 **7 Claims**

1. An ink jet ink comprising:
(a) an aqueous carrier medium;
(b) an aqueous carrier medium insoluble colorant
(c) a polymer dispersant; and
(d) a linear polymer additive selected from the group consisting of:
(i) water soluble, elastomeric ABA block polymers wherein the B block comprises an elastomeric polymer having a Tg of <0° C. and a degree of polymerization of >10, and wherein the A block comprises a non-elastomeric acrylic or methacrylic polymer having a Tg >10° C. and a degree of polymerization of <20; and
(ii) water-dispersible β-diketone polymers wherein the linear polymer additive is present in the amount of 0.5 to 20% by weight.

6,040,359
WASHABLE COLORING COMPOSITION SUITABLE FOR USE IN DRY ERASE MARKERS

Andree F. Santini, Easton, Pa., and Richard E. Miller, Palm Coast, Fla., assignors to Binney & Smith Inc., Easton, Pa.

Continuation-in-part of application No. 08/800,755, Feb. 14, 1997, and a continuation-in-part of application No. 08/918,732, Aug. 1, 1997, Pat. No. 5,900,094. This application Feb. 13, 1998, Appl. No. 23,621.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] C09D *11/16;161/10;* **C08K** *5/36;* **C08L** *61/10*
U.S. Cl. 523—161 **22 Claims**

1. A washable coloring composition comprising:
(a) a colorant comprising a pigment;
(b) a dye vehicle;
(c) a release agent; and
(d) an anionic dyeblocker in an amount sufficient to enhance the fugitivity of said composition from skin and fabric.

6,040,360
COATING COMPOSITION COMPRISING STABILIZED INORGANIC PIGMENTS

Gregory G. Menovcik, Farmington Hills; Thomas C. Balch, West Bloomfield; Hilary P. Davis, Utica, and Paul Dudek, Dearborn, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Continuation of application No. 08/552,814, Nov. 3, 1995, abandoned. This application Jun. 13, 1997, Appl. No. 874,938.
Int. Cl.[7] C08K *9/04;3/20;3/10*
U.S. Cl. 523—206 **7 Claims**

1. A waterborne coating composition comprising a principal resin selected from the group consisting of polyurethane resins, acrylic resins and mixtures thereof, water, an inorganic pigment used in mixture with a pigment treatment composition comprising ester resin selected from the group consisting of polyester, phosphate ester and pyrophosphate ester resins, aminoplast resin and solvent, wherein the pigment is selected from the group consisting of titanium dioxide, iron oxides, chromium oxides, lead oxides, zinc chromate, antimony oxides, cadmium sulfide, cadmium selenide and nickel titanate and any of the preceding pigments treated with aluminum oxides, and mixtures thereof, treated by a method of

a) forming a pigment treatment composition comprising
i) 25.0 to 65% by weight based on total pigment treatment composition weight of a resin selected from the group consisting of polyester resins having an acid number between 15 and 50, and phosphate ester and pyrophosphate ester resins having an acid number between 10 and 50, and
ii) 5.0 to 25.0% by weight based on total pigment treatment composition of an aminoplast resin, and
iii) 10 to 45% by weight based on total pigment treatment composition of solvent selected from the group consisting of ethylene and propylene glycol ethers,
b) combining the pigment treatment composition and the inorganic pigment to form a mixture
c)grinding the pigment mixture to form a pigment paste, and
d) forming a dispersion of the pigment grind, wherein the dispersion comprises between 1 and 20.0% by weight of the coating composition.

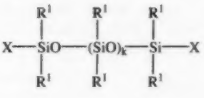
6,040,361
ORGANOPOLYSILOXANE COMPOSITIONS

Hironao Fujiki; Kei Miyoshi, and Hironobu Muramatsu, all of Gunma-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1998, Appl. No. 193,850
Claims priority, application Japan, Nov. 19, 1997, 9-335150
Int. Cl.[7] C08G *77/08*
U.S. Cl. 523—209 **20 Claims**

1. An organopolysiloxane composition comprising:
(A) 100 parts by weight of an organopolysiloxane of the following general formula (I):

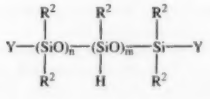
(1)



wherein R^1 and X are independently selected from the group consisting of alkyl, aryl, aralkyl, and alkenyl radicals having 1 to 10 carbon atoms, substituted ones or these radicals wherein some of the hydrogen atoms attached to carbon atoms are replaced by halogen atoms, and hydroxyl radicals, k is an integer of at least 4, alkenyl or hydroxyl or both radicals account for 0.001 to 1 mol % of the entire R^1 and X radicals,

(B) 0.1 to 50 parts by weight of an organohydrogenpolysiloxane having at least three hydrogen atoms each attached to a silicon atom in a molecule, represented by the following general formula (2):

(2)



wherein R^2 is selected from the group consisting of alkyl, aryl, and aralkyl radicals having 1 to 10 carbon atoms, and substituted monovalent ones of these radicals wherein some of the hydrogen atoms attached to carbon atoms are replaced by halogen atoms, Y is hydrogen or R^2, m is an integer of at least 1, n is an integer inclusive of 0, the sum of m+n is an integer of 3 to 500,

(C) 0 to 20 parts by weight of a compound having an active hydrogen radical,

(D) a platinum group metal catalyst enclosed in a compound selected from the group consisting of thermoplastic organic resins; thermoplastic silicone resins, and heat-fusible compounds with a molecular weight of up to 1,000, all having a melting or softening point of 40 to 200° C., in an amount to give 1 to 1,000 parts by weight of platinum group metal atom per million parts by weight of the entire composition,

(E) a platinum group metal catalyst in an amount to provide platinum group metal in an amount of from 1/100,000 up to 1/10 (by weight) of the amount of platinum group metal available from component (D),

(F) 0.001 to 20 parts by weight of an addition reaction retarder, and

(G) 0 to 1,000 parts by weight of a filler.

6,040,362

HEAT-CONDUCTING POLYMER COMPOSITION

Katsutoshi Mine; Osamu Mitani; Kazumi Nakayoshi, and Rikako Tazawa, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Midland, Mich.

Filed Jun. 18, 1998, Appl. No. 99,636

Claims priority, application Japan, Jun. 20, 1997, 9-180728

Int. Cl.[7] C08K *9/00;3/10;3/22;* **C08L** *83/04*

U.S. Cl. 523—212 **31 Claims**

1. A heat-conducting polymer composition, comprising a silicone polymer and a heat-conducting metal powder, wherein the metal powder comprises a metal having a surface layer selected from the group consisting of metal oxides, metal nitrides and mixtures thereof.

6,040,363

METATHESIS POLYMERIZERED OLEFIN COMPOSITES INCLUDING SIZED REINFORCEMENT MATERIAL

Mark W. Warner, Benton; Steven D. Drake, Sherwood, both of Ark., and Michael A. Giardello, Pasadena, Calif., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Provisional application No. 60/057,999, Sep. 5, 1997. This application Sep. 4, 1998, Appl. No. 148,459.

Int. Cl.[7] C08K *9/06;3/40*

U.S. Cl. 523—214 **21 Claims**

1. A reinforced polyolefin article comprising:

a) a reinforcing material at least partially coated with a compatible coupling agent other than a functionalized silane having a primary amine functional group or a functionalized silane having a terminal epoxide functional group; and

b) a polyolefin prepared by polymerizing an olefin monomer in the presence of the coupling agent and a metathesis polymerization catalyst which comprises a ruthenium carbene complex catalyst or an osmium carbene complex catalyst, whereby the coupling agent is disposed between the reinforcing material and the polyolefin.

6,040,364

METHODS FOR PRODUCING ELASTOMERIC COMPOSITIONS

Melinda Ann Mabry, Newton; Frederick Harry Rumpf, Billerica, both of Mass.; Ivan Zlatko Podobnik, Nashua, N.H.; Scott Adrian Westveer, Westord; Allan Clark Morgan, Manchester, both of Mass.; Bin Chung, Nashua, N.H., and Malcolm John Andrews, Bryan, Tex., assignors to Cabot Corporation, Boston, Mass.

Continuation of application No. 08/625,163, Apr. 1, 1996, abandoned. This application Nov. 17, 1997, Appl. No. 969,713.

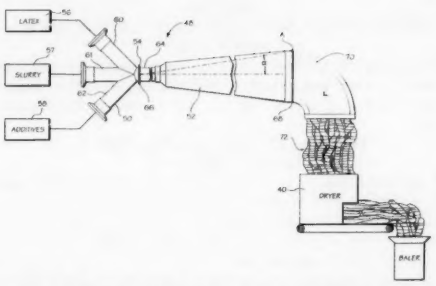
Int. Cl.[7] C08K *3/00*

U.S. Cl. 523—318 **30 Claims**

1. A method of producing elastomer masterbatch, comprising:

feeding a continuous flow of first fluid comprising elastomer latex to a mixing zone of a coagulum reactor defining an elongate coagulum zone extending from the mixing zone to a discharge end;

feeding a continuous flow of second fluid comprising particulate filler under pressure to the mixing zone of the coagulum reactor to form a mixture with the elastomer latex, the mixture passing as a continuous flow to the discharge end and the



particulate filler being effective to coagulate the elastomer latex, wherein feeding of the second fluid against the second fluid within the mixing zone is sufficiently energetic to substantially completely coagulate the elastomer latex with the particulate filler prior to the discharge end; and

discharging a substantially continuous flow of elastomer masterbatch from the discharge end of the coagulum reactor.

6,040,365

FINISHED SWIMMING CAPS, AND COMPOSITIONS AND METHODS FOR PRODUCING SAME

John B. Theders, 26881 Mirlo Cir., Mission Viejo, Calif. 92691

Division of application No. 08/966,184, Nov. 7, 1997, Pat. No. 5,925,418, which is a division of application No. 08/679,107, Jul. 12, 1996, Pat. No. 5,724,671. This application May 21, 1999, Appl. No. 316,711.

Int. Cl.[7] A42B *1/12;* **B05D** *5/08*

U.S. Cl. 524—47 **8 Claims**

1. A composition useful for providing a finish on a swimming cap comprising:

water;

a reactable silicon-containing component in an amount effective to form a coating including said reactable silicon-containing component on the surface of a swimming cap contacted with said composition; and

a starch component present in an amount effective in providing non-stick properties to the surface of a swimming cap contacted with said composition.

6,040,366

LIQUID INJECTION MOLDING SILICONE ELASTOMERS HAVING PRIMERLESS ADHESION

Frank S. Burkus, II, Troy; Edward M. Jeram, Burnt Hill, and Slawomir Rubinsztajn, Niskuyuna, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 27, 1998, Appl. No. 32,461

Int. Cl.[7] C08K *5/34;* **C08L** *83/04*

U.S. Cl. 524—99 **26 Claims**

1. A curable silicone elastomer composition comprising:

1) a silicone elastomer;

2) a salt of a cationic organic nitrogen compound;

3) bis(trimethoxysilylpropyl)fumarate; and

4) a silanol terminated polymer having the formula:

$$(HO(R^{A1})_2SiO_{1/2})_2(R^{A2}R^{A3}SiO_{2/2})_{x'}(R^{A4}R^{A5}SiO_{2/2})_{y'}$$

where each of R^{A1}, R^{A2}, R^{A3}, and R^{A4}, is independently a one to forty carbon atom monovalent organic radical and R^{A5} is a two to forty carbon atom monovalent olefinic organic radical where the subscript y' may range from 0 to about 50 and the subscript x' may range from 0 or 1 to about 100, and a weight percent alkenyl content that ranges from zero when the subscript y' is zero to about 25 weight percent when the subscript y' is greater than zero; and

5) a silicone soluble in said curable elastomer composition wherein said silicone is less soluble in said curable elastomer

composition when said curable composition has been cured whereby said silicone bleeds out of said cured composition and wherein the compression set of the cured silicone elastomer is less than the compression set of the cured silicone elastomer free of said nitrogen compound.

6,040,367

POLYCARBONATE RESIN COMPOSITION

Shinya Miya, and Satoshi Kanayama, both of Hiratsuka, Japan, assignors to Mitsubishi Engineering-Plastics Corporation, Japan

Continuation of application No. 08/805,805, Feb. 25, 1997, Pat. No. 5,948,838. This application Jul. 29, 1998, Appl. No. 127,712.

Claims priority, application Japan, Mar. 6, 1996, 8-48700; Mar. 27, 1996, 8-71860; Mar. 27, 1996, 8-71861; Apr. 17, 1996, 8-95269; Apr. 17, 1996, 8-95270; Apr. 30, 1996, 8-109189; May 15, 1996, 8-120066

Int. Cl.[7] **G08K** *5/15*

U.S. Cl. 524—107 **3 Claims**

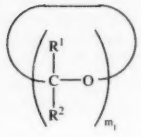
1. A method for protecting polyearbonate resin composition-based medical supplies or appliances against discoloration when sterilized by an ionizing radiation, the method comprising using in said medical supplies or appliances a polycarbonate resin composition comprising:

100 parts by weight of a polycarbonate resin; and

0.01 to 5 parts by weight of a substituted or unsubstituted compound containing an oxymethylene unit or a substituted cyclic ether compound,

said substituted or unsubstituted compound containing an oxymethylene unit being represented by the following formula (1):

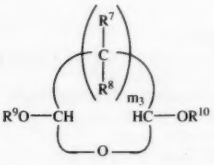
(1)



wherein R^1 and R^2 are independently a hydrogen atom, a (C_1–C_{30}) alkyl group, a (C_3–C_{30}) cycloalkyl group, a (C_2–C_{30}) alkenyl group, a (C_6–C_{30}) aryl group, a (C_6–C_{30}) aryl (C_1–C_{30}) alkyl group, a (C_6–$_{30}$) aryl (C_2–C_{30}) alkenyl group, a hydroxy group, a (C_1–C_{30}) alkoxy group, a (C_1–C_{30}) acyl group or a (C_1–C_{30}) acyloxy group, in which said aryl group, said arylalkyl group and said arylalkenyl group may have substituent group(s) bonded to the aromatic ring thereof, the substituent group(s) being a (C_1–C_{10}) alkyl group or a halogen atom; and m_1 is an integer of not less than 3, and

said substituted cyclic ether compound being represented by the following formula (3):

(3)



wherein R^7 and R^8 are independently a hydrogen atom, a (C_1–C_{30}) alkyl group, a (C_3–C_{30}) cycloalkyl group, a (C_2–C_{30}) alkenyl group, a (C_6–C_{30}) aryl group, a (C_6–C_{30}) aryl (C_1–C_{30}) alkyl group, a (C_6–C_{30}) aryl (C_2–C_{30}) alkenyl group, a hydroxy group, a (C_1–C_{30}) alkoxy group, a (C_1–C_{30}) acyl group or a (C_1–C_{30}) acyloxy group, in which said aryl group, said arylalkyl group and said arylalkenyl group may have substituent group(s) bonded to the aromatic ring thereof, the substituent group(s) being a (C_1–C_{10}) alkyl group or a halogen atom; R^9 and R^{10} are independently a hydrogen atom, a (C_1–C_{30}) alkyl group, a (C_3–C_{30}) cycloalkyl group, a (C_2–C_{30}) alkenyl group, a (C_6–C_{30}) aryl group, a (C_6–C_{30}) aryl (C_1–C_{30}) alkyl group, a (C_6–C_{30}) aryl (C_2–C_{30}) alkenyl group or a (C_1–C_{30}) acyl group, in which said aryl group, said arylalkyl group and said arylalkenyl group may have substituent group(s) bonded to the aromatic ring thereof, the substituent group(s) being (C_1–C_{10}) alkyl group or a halogen atom; and m_3 is an integer of not less than 1.

6,040,368

AQUEOUS COATING COMPOSITIONS WITH EXTENDED OPEN TIME

Tammy Lynne Maver, Moorestown, N.J., and Robert Krasnansky, LeRouret, France, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 18, 1998, Appl. No. 195,373

Int. Cl.[7] **C08K** *5/15*

U.S. Cl. 524—110 **8 Claims**

1. An aqueous coating composition having extended open time comprising an emulsion polymer, said polymer comprising a copolymerized ethylenically-unsaturated monomer having a pendant group selected from the group consisting of acetoacetate, acetoacetamide, cyanoacetate, and cyanoacetamide; a polyether monoamine or polyether diamine having primary or secondary amino functionality; and an alkyl polyglycoside.

6,040,369

MEDICAL ELECTRICAL LEAD AND REINFORCED SILICONE ELASTOMER COMPOSITIONS USED THEREIN

Mark J. Paulsen, Santa Barbara, Calif.; Jennifer P. Miller, Elk River, and Michael J. Ebert, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of application No. 08/697,991, Sep. 4, 1996. This application Jun. 2, 1999, Appl. No. 324,410.

Int. Cl.[7] **C08K** *5/21*

U.S. Cl. 524—212 **4 Claims**

1. An uncured elastomer blend composition suitable for curing by cross linking, the composition comprising two aliquots in combination:

the first aliquot comprising an intimately admixed mixture of the following components:

(1) approximately 23 to 45 percent by weight of silica that had been silyliated by treatment and contains trialkylsilyl groups;

(2) approximately 55 to 77 per cent by weight of a polysiloxane copolymer composed of divalent —R_1R_2SiO—, divalent —R_3R_4SiO— and end-blocking $R_5R_6R_7SiO$— units, where R_1 and R_2 independantly are lower alkyl of 1 to 6 carbons, phenyl or trifluoropropyl, R_3 is vinyl, allyl, or other olefinic group having up to 4 carbons, R_4 is lower alkyl of 1 to 6 carbons, phenyl or trifluoropropyl, and R_5, R_6, and R_7 independantly are lower alkyl of 1 to 6 carbons, phenyl, vinyl, allyl, or other olefinic group having up to 4 carbons and one double bond, the polysiloxane copolymer has a degree of polymerization (D. P.) approximately in the range of 3500 to 6500, and the olefin containing —R_3R_4SiO— groups are present randomly distributed in the polysiloxane copolymer and approximately in the 0.05 to 0.3 mol percent range, with the provisos that when R_1, or R_2, or both represent phenyl groups then proportion of the phenyl-containing divalent siloxane units does not exceed 15 mol per cent. and when R_1 or R_2 or both represent trifluoropropyl groups, then the proportion of the trifluoropropyl-containing divalent siloxane units does not exceed approximately 40 mol per cent in the polysiloxane copolymer; and a

(3) a catalyst,

the second aliquot comprising an intimately admixed mixture of the following components:

(1) approximately 23 to 45 percent by weight of silica that had been silyliated by treatment and contains trialkylsilyl groups;

(2) approximately 55 to 77 per cent by weight of a polysiloxane copolymer composed of divalent $—R_1R_2SiO—$, divalent $—R_3R_4SiO—$ and end-blocking $R_5R_6R_7SiO—$ units, where R_1 and R_2 independantly are lower alkyl of 1 to 6 carbons, phenyl or trifluoropropyl, R_3 is vinyl, allyl, or other olefinic group having up to 4 carbons, R_4 is lower alkyl of 1 to 6 carbons, phenyl or trifluoropropyl, and R_5, R_6, and R_7 independantly are lower alkyl of 1 to 6 carbons, phenyl, vinyl, allyl, or other olefimic group having up to 4 carbons and one double bond, the polysiloxane copolymer has a degree of polymerization (D. P.) approximately in the range of 3500 to 6500, and the olefin containing $—R_3R_4SiO—$ groups are present randomly distributed in the polysiloxane copolymer and approximately in the 0.05 to 0.3 mol percent range, with the provisos that when R_1, or R_2, or both represent phenyl groups then proportion of the phenyl-containing divalent siloxane units does not exceed 15 mol per cent. and when R_1 or R_2 or both represent trifluoropropyl groups, then the proportion of the trifluoropropyl-containing divalent siloxane units does not exceed approximately 40 mol per cent in the polysiloxane copolymer, and

(3) an organohydrogen polysiloxane cross-linker,

the catalyst and the cross-linker being present in the first and second aliquots respectively in sufficient amounts to cause the cross-linking reaction to occur after the first and second aliquots are intimately mixed.

6,040,370

AQUEOUS FLUOROPOLYMER DISPERSION AND METHOD FOR MAKING FLUOROPOLYMER-CONTAINING THERMOPLASTIC RESIN COMPOSITION

Mary Ellen Wozny, Coolville, Ohio; Ralph P. Chambers, Parkersburg, and James L. Bland, Elizabeth, both of W. Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 17, 1997, Appl. No. 840,830

Int. Cl.[7] C08K *5/04*

U.S. Cl. 524—394 **22 Claims**

1. A stabilized aqueous fluoropolymer dispersion, consisting essentially from 1 part by weight to 80 parts by weight fluoropolymer per 100 parts by weight of the dispersion and from 0.1 part by weight to 10 parts by weight of a fatty acid salt per 100 parts by weight of the fluoropolymer.

6,040,371

ANTIMONY PENTOXIDE DISPERSIONS AND METHOD OF MAKING

David L. Catone, Hopkinton, Mass., assignor to Nyacol Products, Inc., Ashland, Mass.

Division of application No. 08/738,076, Oct. 25, 1996, Pat. No. 5,800,740. This application Jun. 19, 1998, Appl. No. 100,459.

Int. Cl.[7] C08J *3/05;3/215;* **C08K** *3/22;* **C09K** *21/04;21/14*

U.S. Cl. 524—409 **9 Claims**

1. A process for preparing a dispersion of a flame-retardant polymer for forming synthetic fibers consisting of the steps of:

(1) forming an aqueous dispersion of a phosphated antimony pentoxide sol;

(2) mixing the resulting aqueous dispersion with a water-soluble alkanol amine;

(3) concentrating the dispersion to provide an aqueous dispersion containing at least 50 percent antimony pentoxide by weight, based upon the total weight of the dispersion, the sol being characterized as being essentially free of agglomeration such that substantially all the sol will pass through an 8 micron filter; and

(4) admixing the concentrated aqueous phosphated antimony pentoxide dispersion with a solution of polymeric material dispersed in a polar solvent to provide flame retardancy for synthetic fibers made from said admixture.

6,040,372

HYDRATED ZINC STANNATE SOLS, COATING COMPOSITIONS AND OPTICAL ELEMENTS

Yoshitane Watanabe; Keitaro Suzuki; Yoshinari Koyama, and Motoko Iijima, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Division of application No. 08/659,371, Jun. 6, 1996, Pat. No. 5,891,362. This application Aug. 28, 1998, Appl. No. 143,525.

Claims priority, application Japan, Jun. 13, 1995, 7-170249; Jul. 12, 1995, 7-199070; Aug. 24, 1995, 7-215795; Aug. 28, 1995, 7-218915

Int. Cl.[7] C08K *3/10*

U.S. Cl. 524—413 **12 Claims**

1. An optical element having on its surface a cured film made of a coating composition, comprising:

(A) at lease one silicon-containing substance selected from the group consisting of organic silicon compounds of the formula (I):

$$(R^1)_a(R^3)_bSi(OR^2)_{4-(a+b)} \quad (I)$$

wherein each of R^1 and R^3 is an alkyl group, an aryl group, a halogenated alkyl group, a halogenated aryl group, an alkenyl group, or an organic group having an epoxy group, an acryloyl group, a metharcryloyl group, a mercapto group, an amino group or a cyano group, which is bonded to the silicon atom by a Si—C bond, R^2 is a C_{1-8} alkyl group, an alkoxyalkyl group, or an acyl group, and each of a and b is an integer of 0, 1 or 2, provided that a+b is an integer of 0. 1 or 2, and the formula (II)

$$[(R^4)_cSi(OX)_{(3-c)}]_2Y \quad (II)$$

wherein R^4 is a C_{1-8} alkyl group, X is a C_{1-4} alkyl group or an acyl group, Y is a methylene group or a C_{2-20} alkylene group, and c is an integer of 0 or 1, and their hydrolyzates; and

(B) particles of a hydrated zinc stannate having a primary particle diameter of from 2 to 200 nm and represented by the formula $xZnO{\cdot}ySnO_2{\cdot}zH_2O$ wherein the molar ratio of x:y:z is 1:0.83 to 1. 43:1.00 to 5.00.

6,040,373

Patent Not Issued For This Number

6,040,374

PROPYLENE RESIN COMPOSITION AND METHOD FOR EVALUATING THE SAME

Yoshihiro Sobajima; Etsushi Akashige; Hironari Fujii, and Akira Amano, all of Yokkaichi, Japan, assignors to Japan Polychem Corporation, Tokyo-To, Japan

Filed Aug. 5, 1998, Appl. No. 129,700

Claims priority, application Japan, Aug. 7, 1997, 9-213682; Aug. 18, 1997, 9-221757

Int. Cl.[7] C08K *3/34;* **C08F** *110/06;210/06;* **C08L** *23/12*

U.S. Cl. 524—451 **7 Claims**

1. A method for evaluating a propylene resin composition, which comprises subjecting a propylene resin composition to electron spectroscopy for chemical analysis to measure the ratio of the valence electron spectral intensity at a bond energy of 16.5 eV to

the valence electron spectral intensity at a bond energy of 13.5 eV, I 16.5/I 13.5; and evaluating, based on the ratio, the amount of a rubber component present on the surface of the composition.

6,040,375

COMPOSITE FOAMS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Klaus-Jürgen Behme, Eppstein; Rolf-Michael Jansen, Kelkheim, and Andreas Zimmermann, Griesheim, all of Germany, assignors to Hoechst AG, Frankfurt, Germany

Continuation of application No. 08/387,278, Feb. 13, 1995, abandoned. This application Jun. 2, 1997, Appl. No. 869,864.

Claims priority, application Germany, Feb. 15, 1994, 44 04 701

Int. Cl.[7] **C08J** *5/01;* **C08K** *3/34*

U.S. Cl. 524—492 **13 Claims**

1. A composite foam comprising

(a) 10 to 90% by volume of SiO_2 aerogel which has been silylated and then dried under subcritical conditions to form xerogel particles having a particle size range of 0.01 mm to about 30 mm, and

(b) 90 to 10% by volume of a blown plastic foam;

said composite foam having thermal conductivity of from 0.015 to 0.040 W/mK.

6,040,376

ANIONIC WATER-SOLUBLE POLYMER PRECIPITATION IN SALT SOLUTION

Joseph J. Mallon, Danbury; Raymond S. Farinato, Norwalk, both of Conn.; Louis Rosati, South Salem, and John J. Freeman, Jr., Valhalla, both of N.Y., assignors to Cytec Technology Corp., Wilmington, Del.

Continuation of application No. 08/726,157, Oct. 3, 1996, Pat. No. 5,889,097. This application Nov. 5, 1998, Appl. No. 187,566.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C08L** *41/00*

U.S. Cl. 524—547 **18 Claims**

1. A process comprising mixing, in any order, water, at least one anionic water-soluble polymer, at least one kosmotropic salt, and at least one cationic organic salt, to form an aqueous composition comprising at least one precipitated anionic water-soluble polymer, wherein said salts are used in amounts effective to precipitate said at least one anionic water-soluble polymer.

6,040,377

CHLOROPRENE RUBBER COMPOSITION

Nobuhiko Fujii; Mitsuyuki Nakada, and Kazuomi Aoki, all of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1999, Appl. No. 252,202

Claims priority, application Japan, Feb. 19, 1998, 10-037452

Int. Cl.[7] **D03J** *1/00*

U.S. Cl. 524—571 **13 Claims**

1. A chloroprene rubber composition which contains carbon black and of which the breaking elongation A and the static modulus in shear B of the vulcanizate satisfy the following formula:

$$A \geqq -36.4 \times B + 1090 \quad (1)$$

where A is the breaking elongation (%) and B is the static modulus in shear (kgf/cm^2).

6,040,378

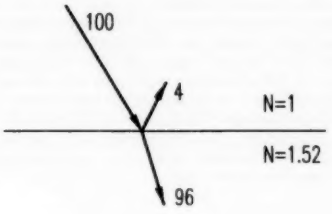
COATING FOR GLASS SUBSTRATE FOR ANTI-REFLECTIVE PROPERTIES WITH ABRASION, CHEMICAL AND UV RESISTANCE

Mohan L. Sanduja, Flushing; Carl Horowitz, Brooklyn; Abraham Thomas, Staten Island, and Paul Thottathil, New Hyde Park, all of N.Y., assignors to AFG Industries, Inc., Kingsport, Tenn.

Filed May 15, 1998, Appl. No. 79,148

Int. Cl.[7] **C08J** *3/00;* **C08K** *3/20;5/54;5/56;* **C08L** *83/00*

U.S. Cl. 524—588 **6 Claims**



1. A coating composition comprising methylpolysiloxane, a methacrylate-functional trimethoxysilane, benzoyl peroxide and zirconium propionate.

6,040,379

STARCH COPOLYMER PRODUCTS AND PROCESS

Gary Luebke, Olathe, Kans.; Kenneth Curtis Benton, Cedar Rapids, and Yakov A. Letuchy, Iowa City, both of Iowa, assignors to Penford Corporation, Bellevue, Wash.

Provisional application No. 60/055,841, Aug. 15, 1997. This application Aug. 13, 1998, Appl. No. 133,625.

Int. Cl.[7] **C08L** *3/04*

U.S. Cl. 524—734 **38 Claims**

1. A method for the preparation of a starch copolymer product which is the reaction product of starch and one or more synthetic monomers capable of undergoing free radical polymerization wherein said reaction product is in the form of an emulsion or dispersion having weight-average particle sizes less than 180 nm as measured by Capillary Hydrodynamic Fractionation comprising the steps of:

(a) dissolving or colloidally dispersing starch in an aqueous solvent to form a starch solution or dispersion;

(b) heating the starch solution or dispersion to a specified temperature range;

(c) adding to the starch solution or dispersion a first portion of said synthetic monomer and a free radical initiator for initiation of polymerization of the starch component and said synthetic monomer; and

(d) after free radical polymerization of said synthetic monomers has been initiated in the presence of said starch, adding additional portions of synthetic monomer capable of undergoing free radical polymerization to the starch solution or dispersion wherein at least 75% of the total synthetic monomer to be reacted with said starch is added more than one hour after initiation of said free radical polymerization.

6,040,380
HIGH SOLIDS COPOLYMER DISPERSION FROM A LATEX AND ITS USE IN CAULKS, SEALANTS AND ADHESIVES

James H. Dunaway, Cuyahoga Falls; Pamela K. Hernandez, Brunswick, and Gregory P. Bidinger, Copley, all of Ohio, assignors to Tremco Incorporated, Beachwood, Ohio

Continuation-in-part of application No. 08/690,288, Jul. 26, 1996, Pat. No. 5,744,544, which is a continuation-in-part of application No. 08/321,288, Oct. 11, 1994, Pat. No. 5,541,253. This application Aug. 29, 1997, Appl. No. 921,305.

Int. Cl.[7] **C08L** *31/00;33/00*

U.S. Cl. 524—832 **27 Claims**

1. A caulking or sealant composition comprising:

a) a polymeric dispersion which is at least 75 wt. % polymer particles in a medium comprising water, wherein the polymer particles have a particle size distribution having particles of diameter of 4.0 microns or more, and wherein the particles of diameter of 4.0 microns or more have nonspherical shape such that they have an average aspect ratio between largest and smallest diameter of each particle of at least 1.5, and

wherein said particles of said dispersion are comprised of at least 50 wt. % repeat units from one or more acrylate and/or vinyl acetate monomers.

6,040,381
PREPARATION OF FILLED REACTIVE POLYURETHANE CARPET BACKING FORMULATIONS USING AN IN-LINE CONTINUOUS MIXING PROCESS

James K. Jennings, Rocky Face; Randall C. Jenkines, Dalton, and Larry W. Mobley, Cohutta, all of Ga., assignors to The Dow Chemical Company, Midland, Mich.

Division of application No. 08/905,509, Aug. 4, 1997, Pat. No. 5,908,701, Provisional application No. 60/033,128, Dec. 10, 1996. This application Mar. 12, 1999, Appl. No. 267,273.

Int. Cl.[7] **C08J** *3/00;9/00;11/00*

U.S. Cl. 524—871 **8 Claims**

1. A polyurethane-forming reactive mixture comprising:

(a) an isocyanate-reactive material;

(b) a polyisocyanate; and

(c) a filler;

wherein the filler is included at a concentration of at least about 300 parts per 100 parts of isocyanate-reactive material, and wherein the mixture is obtained by continuously and simultaneously metering

(a) an isocyanate-reactive material;

(b) a polyisocyanate; and

(c) a filler;

to a means for mixing (a), (b), and (c) wherein the means for mixing (a), (b), and (c), is a low-shear or no-shear mixer, and wherein a thermal rise of less than 40° F. is observed.

6,040,382
POLYMER BLEND CLARITY

Mark D. Hanes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 4, 1994, Appl. No. 192,334

Int. Cl.[7] **C08L** *9/00*

U.S. Cl. 525—98 **15 Claims**

1. A method for improving the optical clarity of a blend of (a) resinous polymodal monovinyl aromatic-conjugated diene block copolymer and (b) styrene-maleic anhydride copolymer, said method comprising combining therewith (c) poly(alpha-methylstyrene) in an amount sufficient to produce a blend composition which exhibits lower haze than said blend of (a) and (b).

wherein polymer (a) contains about 65–90 weight percent of at least one polymerized monovinyl aromatic compound and polymer (b) contains about 50–95 weight percent of ploymerized styrene.

6,040,383
ORGANOSILICON COMPOUNDS CONTAINING OLIGOISOBUTYLENE OR POLYISOBUTYLENE GROUPS

Jochen Dauth; Thomas Hierstetter; Bernward Deubzer, all of Burghausen, and Petra Gratzl, Tuessling, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 31, 1998, Appl. No. 52,508

Claims priority, application Germany, Apr. 14, 1997, 197 15 513

Int. Cl.[7] **C08F** *8/00;* **C08L** *43/00*

U.S. Cl. 525—100 **14 Claims**

1. An organosilicon compound comprising oligoisobutylene or polyisobutylene groups and comprising at least one unit of the formula

$$A_aR_bSiX_cO_{4-(a+b+c)/2},$$

where R are identical or different and are each a monovalent, divalent or trivalent unsubstituted or substituted hydrocarbon radical, X are identical or different and are each a chlorine atom or a radical of the formula —OR^1, where R^1 is a hydrogen atom or X is an alkyl radical which may be substituted by an ether oxygen atom, or a radical of the formula

$$—R^2(\{OCH(CH_3)CH_2\}_e\{OCH_2CH_2\}_f\{O(CH_2)_4\}_gOR^3)_y \qquad (II)$$

where R^2 is a divalent or trivalent, unsubstituted or substituted hydrocarbon radical which is substituted by one or more groups of the formulae

—(C=O)—O—, —(C=O)—NR^3—, —NR^3—, —O—, —S—,

R^3 is R^1 or a radical of the formula

—(C=O)—R^1,

e, f and g are each an integer of 0–200, with the proviso that the sum e+f+g≧1 and y is 1 or 2,

a is 0, 1 or 2,

b is 0, 1, 2 or 3,

c is 0, 1, 2 or 3 and the sum a+b+c≦4, and

A is a radical which contains an oligoisobutylene or polyisobutylene group, with the proviso that at least one radical of the formula A is present per molecule.

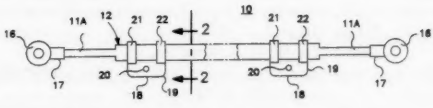
6,040,384
CABLE ASSEMBLIES

Kim A. Reynolds, Berwyn; Charles P. Marino, Philadelphia, and Kevin P. Kray, Phoenixville, all of Pa., assignors to Markel Corporation, Norristown, Pa.

Continuation-in-part of application No. 08/472,514, Jun. 7, 1995, which is a continuation-in-part of application No. 07/263,182, Oct. 27, 1988, Provisional application No. 60/015,543, Apr. 17, 1996. This application Apr. 17, 1997, Appl. No. 843,928.

Int. Cl.[7] **C08F** *8/30*

U.S. Cl. 525—180 **1 Claim**



1. A motion transmitting cable assembly comprising:

an elongated core for transmitting a force along a predetermined path; and

an abrasion resistant paste extruded tubular product for guiding the core and having a low friction inner surface against which said core bears as it transmits the force along said predetermined path, said low friction surface comprising a major proportion of fluorocarbon polymer resin and less than about 10% by weight polyimide resin.

6,040,385

ADHESION PROMOTERS FOR PLASTISOLS

Albert Van De Berg, Kreuzau, and Doris Fitzek, Duren, both of Germany, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 15, 1994, Appl. No. 356,663

Claims priority, application Germany, Dec. 15, 1993, 43 42 672

Int. Cl.[7] C08L *39/04*

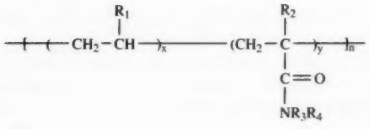
U.S. Cl. 525—205 **7 Claims**

1. A process for producing a plastisol composition which comprises adding 0.1–5 wt %, based on total plastisol composition, of an adhesion promoter to a plastisol comprising polyvinyl chloride, vinyl chloride copolymer or polyalkylene methacrylate in a plasticizer to form the plastisol composition, wherein the adhesion promoter is a product of:

reacting an α-olefin by radical polymerization with at least one monounsaturated carboxylic acid or monounsaturated carboxylic acid ester or anhydride to form a copolymer; and

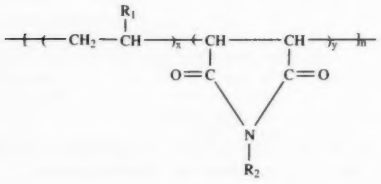
reacting the copolymer with at least one polyamine having at least one primary amino group to form the adhesion promoter, wherein the adhesion promoter is represented by Formula I, II or III

I



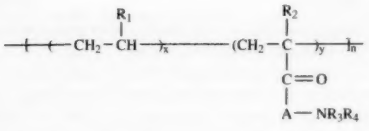
where x=1; y=1–4; n=5–50; R_1=C_6–C_{22} alkyl radical; R_2=H or CH_3; R_3=H or C_1–C_3 alkyl radical; and R_4 is a hydrocarbon radical with 2 to 14 carbon atoms and at least one amino group; or R_3 and R_4 form a piperazine ring with the amide nitrogen atom;

II



wherein x=1; y=1–2; n=5–50; R_1=C_8–C_{22} alkyl radical; and R_2 is a hydrocarbon radical with 2 to 14 carbon atoms and at least one amine group;

III



wherein x=1; y=1–4; n=5–50; R_1=C_8–C_{22} alkyl radical; R_2=H or CH_3; A=—$OCH_2CH(OH)$—CH_2—; and R_3 and R_4 are defined as in Formula I.

6,040,386

(METH)ACRYLIC POLYMERS, METHOD FOR MAKING SAME AND USE THEREOF AS PIGMENT DISPERSANT

Ilias Iliopoulos, Paris; Francoise Lafuma, Sceaux; Jean-Philippe Gillet, Gainneville, all of France, and Erwoan Pezron, Prairie Village, Kans., assignors to Cray Valley S.A, Puteaux, France

PCT No. PCT/FR96/01309, § 371 Date Sep. 18, 1998, § 102(e) Date Sep. 18, 1998, PCT Pub. No. WO97/08217, PCT Pub. Date Mar. 6, 1997

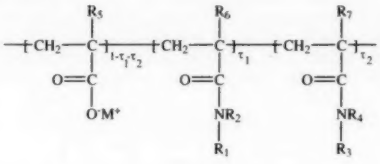
PCT Filed Aug. 22, 1996, Appl. No. 11,742

Claims priority, application France, Aug. 24, 1995, 95 10042

Int. Cl.[7] C08F *8/32*

U.S. Cl. 525—329.9 **15 Claims**

1. A (meth)acrylic copolymer having monomer units represented by the formula



wherein

the M^+ are monovalent cations arising from the neutralization of the —COOH groups, it being possible, however, for this neutralization to have been only partial;

R_1 and R_2 are selected from the group consisting of: hydrogen, long-chain linear or branched cycloalkyl or alkyl radicals, containing from 8 to 30 carbon atoms, and aryl radicals having from 8 to 22 carbon atoms, with the condition that at least one of R_1 and R_2 is not hydrogen;

R_3 and R_4 are independently selected from the group consisting of: a hydrogen atom, short-chain cycloalkyl and alkyl radicals having from 1 to 7 carbon atoms and aryl radicals having from 6 to 7 carbon atoms;

R_5, R_6 and R_7 are each, independently of one another, selected from the group consisting of a hydrogen atom and a methyl radical;

τ_1 represents the molar ratio of long-chain amide units with respect to all monomeric units of copolymer; and

τ_2 represents the molar ratio of optional short-chain amide units with respect to all monomeric units of the copolymer molecule, and

the weight-average molecular weight of the copolymer does not exceed 30,000 and τ_1 , is between 0.01 and 0.30.

6,040,387

POLY (METH) ACRYLAMIDES WITH IMPROVED COLOR STABILITY UNDER THERMAL STRESS

Klaus Albrecht, Mainz; Werner Hoess, Heusenstamm, and Hartmut Schikowsky, Darmstadt, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

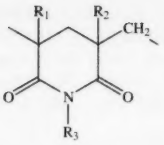
Division of application No. 08/759,131, Dec. 2, 1996, Pat. No. 5,837,780. This application May 12, 1998, Appl. No. 75,880.

Claims priority, application Germany, Dec. 1, 1995, 195 44 562

Int. Cl.[7] G08F *8/32*

U.S. Cl. 525—330.5 **6 Claims**

1. A molded article MA prepared from a molding composition MC, consisting of: a polymer PM containing units of formula (I):



wherein R_1 and R_2 are hydrogen and methyl and R_3 denotes hydrogen, C_1–C_{18} alky, C_5–C_8 cycloalkyl, C_6–C_{10} aryl, C_6–C_{10} aryl-C_1–C_4 alkyl, wherein these groups can be substituted up to three times with groups selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy and halogen, said polymer prepared by:

imidizing a (meth)acrylate ester with a primary amine in a reaction extruder thereby preparing polymer PM; and

blending from 0.005–1 wt % of at least one reducing inorganic phosphorous compound IP selected from the group consisting of phosphinic and phosphonic acid and its alkali metal, alkaline-earth metal, aluminum and ammonium salts, wherein the ammonium ion can be substituted with up to four C_1–C_4 alkyl and/or C_5–C_8 cycloalkyl groups, with the polymer PM after conclusion of the imidation reaction.

6,040,388

COPOLYMER, HYDROGENATED PRODUCT THEREOF, AND PROCESS FOR PRODUCING THE SAME

Koichi Nishimura, Kawasaki; Tatsuya Kawamura, and Toyozo Fujioka, both of Tokuyama, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1997, Appl. No. 966,439

Claims priority, application Japan, Nov. 27, 1996, 8-330225; Aug. 25, 1997, 9-241686

Int. Cl.[7] **C08F** *32/00*

U.S. Cl. 525—332.1 **14 Claims**

1. A hydrogenated product of a copolymer of cyclopentadiene and/or dicyclopentadiene and a vinyl-substituted aromatic compound which is obtained by hydrogenating a copolymer of cyclopentadiene and/or dicyclopentadiene and a vinyl-substituted aromatic compound, said copolymer having a softening point of from 60 to 130° C., a vinyl-substituted aromatic compound content of from 30 to 90% by weight, a bromine number of from 30 to 90 g/100 g, a number average molecular weight of from 400 to 1,000 and a weight average molecular weight/number average molecular weight (Mw/Mn) ratio of 2.5 or less, said copolymer produced by conducting a thermal copolymerization while adding in divided portions a mixture of cyclopentadiene and/or dicyclopentadiene and a vinyl-substituted aromatic compound to a solvent, said solvent being in an amount of 50 to 500 parts by weight per 100 parts by weight in total of the cyclopentadiene and/or dicyclopentadiene and the vinyl-substituted aromatic compound, said hydrogenated product having a softening point of from 70 to 140° C., a vinyl-substituted aromatic compound content of from 0 to 35% by weight, a bromine number of from 0 to 30 g/100 g, a number average molecular weight of from 400 to 1,000 and a weight average molecular weight/number average molecular weight (Mw/Mn) ratio of 2.5 or less.

6,040,389

BIS(HYDROXYALKYL ALKYL ESTER) POLYSULFIDES

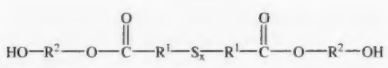
Lawson Gibson Wideman, Hudson, and Paul Harry Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1998, Appl. No. 86,216

Int. Cl.[7] **C08C** *19/20;* **C08K** *3/36;3/04;* **B60C** *11/00*

U.S. Cl. 525—332.6 **12 Claims**

1. A rubber composition comprising an elastomer containing olefinic unsaturation and a bis(hydroxyalkyl alkyl ester) polysulfide of the formula



where R^1 is independently selected from alkylene groups having 1 to 8 carbon atoms, R^2 is independently selected from alkylene groups having 2 to 6 carbon atoms and x is an integer of from 2 to 8.

6,040,390

PROCESS FOR HYDROGENATING CONJUGATED DIENE POLYMERS

Young-Hoon Ko; Jung-Goo Lee, and Jae-Yoon Kim, all of Taejeon, Rep. of Korea, assignors to Korea Kumho Petrochemical Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 20, 1998, Appl. No. 119,340

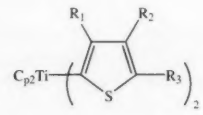
Claims priority, application Rep. of Korea, Mar. 4, 1998, 98-7016

Int. Cl.[7] **C08F** *8/04*

U.S. Cl. 525—338 **7 Claims**

1. Process for hydrogenating a conjugated diene polymers, herein a homopolymer of conjugated diene monomer, or a copolymer consisting of conjugated diene monomer and aromatic vinyl monomer, is hydrogenated under the presence of a novel catalyst represented by the following formula I,

Formula I



Wherein Cp is a cyclopentadienyl (C_5H_5) group;

R_1, R_2 and R_3 can be the same or different.

6,040,391

PROCESS FOR THICKENING THERMOSET RESIN MOLDING COMPOUND COMPOSITIONS

James E. Rinz, University Heights, Ohio, assignor to Premix, Inc., North Kingsville, Ohio

Continuation of application No. 08/769,454, Dec. 18, 1996, Pat. No. 5,854,317, Provisional application No. 60/010,601, Feb. 2, 1996. This application Aug. 28, 1998, Appl. No. 141,931.

Int. Cl.[7] **C08C** *19/22;* **C08F** *8/32;* **C08L** *63/00*

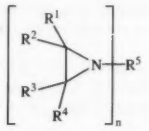
U.S. Cl. 525—375 **17 Claims**

1. A process for making a thickened thermoset resin composition for molding materials, comprising: mixing

(A) a thermoset resin composition, wherein said thermoset resin composition comprises at least one of a poly(ester-imide) resin, an epoxy resin, a vinyl ester resin that is a reaction product of an epoxy resin and a monofunctional ethylenically unsaturated carboxylic acid, and a bisphenol A fumarate resin, and the thermoset resin composition optionally contains an amine acceptor; and

(B) at least one compound represented by the formula

(B-I)



wherein in Formula (B-I): R^1, R^2, R^3 and R^4 are independently hydrogen or methyl; R^5 is hydrogen, a hydrocarbon group or a substituted hydrocarbon group, the substituent on said substituted hydrocarbon group is at least one selected from the group consisting of hydroxy, alkoxy, aziridinyl and ester groups; and n is at least 1.

6,040,392

NYLON 6 OR 66 BASED COMPOSITIONS AND FILMS FORMED THEREFROM HAVING REDUCED CURL

Yash P. Khanna, Morristown; Frank H. Puterbuagh, Jr., Milford; William P. Kuhn, Pine Brook, and Martin J. Schena, Randolph, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Mar. 10, 1998, Appl. No. 38,201

Int. Cl.[7] C08L *77/00*

U.S. Cl. 525—432 **14 Claims**

1. A nylon composition which consists essentially of a substantially uniform blend of at least one semi-crystalline copolymer I and at least one semi-crystalline copolymer II, wherein the proportion by weight of each of copolymer I and copolymer II is such that the composition has only one significant melting point; wherein

(a) copolymer I is a copolymer of a semi-crystalline nylon A and a semi-crystalline different nylon B wherein nylon A is present in copolymer I in an amount of from about 70 percent to about 95 percent by weight and nylon B is present in copolymer I in an amount of from about 5 percent to about 30 percent by weight of copolymer I; and

(b) copolymer II is a copolymer of semi-crystalline nylon A and at least one different semi-crystalline nylon C wherein nylon A is present in copolymer II in an amount of from about 40 percent to about 65 percent by weight and nylon C is present in copolymer II in an amount of from about 35 percent to about 60 percent by weight of copolymer II; and

(c) wherein nylon A and nylon B are selected from the group consisting of nylon 6 and nylon 66; and

(d) wherein nylon C is selected from the group consisting of nylon 9, nylon 11, nylon 12, nylon 46 and nylon 69.

6,040,393

COMPOSITIONS TO PERMIT PRINT-PATTERNED COAGULATION OF POLYURETHANE ON FABRIC SUBSTRATES

Kirkland W. Vogt, Simpsonville, and Shulong Li, Spartanburg, both of S.C., assignors to Milliken & Company, Spartanburg, S.C.

Division of application No. 09/060,625, Apr. 15, 1998, Pat. No. 5,968,597, which is a continuation-in-part of application No. 09/042,922, Mar. 17, 1998, Pat. No. 5,916,636. This application May 12, 1999, Appl. No. 310,550.

Int. Cl.[7] C08K *5/00*

U.S. Cl. 525—454 **4 Claims**

1. An elastomer composition comprising

(i) a water-borne polyurethane latex;

(ii) a heat-activated acid-generating chemical selected from the group consisting essentially of at least one organic acid ester;

(iii) at least one cloud point surfactant;

(iv) at least one thickening agent; and

(v) optionally, at least one cross-linking agent.

6,040,394

CURABLE COMPOSITIONS BASED ON FUNCTIONAL POLYSILOXANES

Truman F. Wilt, Clinton; David N. Walters, Slippery Rock; James A. Claar, Apollo; Karen D. Donnelly, Allison Park; Joseph M. Carney, Gibsonia, all of Pa., and Andrew R. Wolff, Lake Villa, Ill., assignors to PPG Industries Ohio, Inc., Cleveland, Ohio

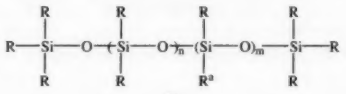
Division of application No. 08/904,597, Aug. 1, 1997, Pat. No. 5,939,491. This application May 11, 1999, Appl. No. 309,977. This patent is subject to a terminal disclaimer.

Int. Cl.[7] C08F *283/12*

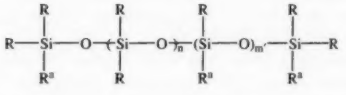
U.S. Cl. 525—474 **9 Claims**

2. A curable composition comprising:

(a) an organic polysiloxane, which contains reactive functional groups, said polysiloxane having the following formula:



or



where m is at least 1; m' is 0 to 50; n is 0 to 50; R is selected from the group consisting of H, OH and monovalent hydrocarbon groups connected to the silicon atoms; R^a has the following structure:

wherein R_1 is alkylene, oxyalkylene or alkylene aryl; and X is a moiety containing a COOH functional group;

(b) a polymer or oligomer which contains reactive functional groups; and

(c) an aminoplast curing agent or a polyepoxide curing agent, such that when the curing agent (b) is an aminoplast, the moiety X contains at least one COOH functional group and when the curing agent (b) is a polyepoxide, at least a portion of the moiety X contains two or more COOH groups.

6,040,395

ELECTRICAL COMPONENTS AND METHOD FOR THE FABRICATION THEREOF

Minoru Isshiki; Katsutoshi Mine, and Kimio Yamakawa, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Division of application No. 08/923,074, Sep. 3, 1997, Pat. No. 5,958,515. This application May 21, 1999, Appl. No. 316,217. Claims priority, application Japan, Sep. 4, 1996, 8-253901

Int. Cl.[7] C08F *283/12*

U.S. Cl. 525—476 **12 Claims**

1. A primer for adhering a cured resin sealant to a cured silicone coating on an electrical element, wherein the primer is selected from the group consisting of:

(i) a mixture of components (a) and (b),

(ii) a reaction mixture of components (a) and (b),

(iii) component (c),

(iv) component (c) and a mixture of components (a) and (b), and

(v) component (c) and a reaction mixture of components (a) and (b),

where component (a) is silanol-functional organopolysiloxane; component (b) is epoxy-functional organoalkoxysilane; and component (c) is organopolysiloxane with the average unit formula: $(R^1SiO_{3/2})_a(R^2{}_2SiO_{2/2})_b(R^2{}_3SiO_{1/2})_c(R^3O_{1/2})_d$

where R^1 is an epoxy-functional monovalent organic group; each R^2 is independently a monovalent hydrocarbon group, R^3 is selected from the group consisting of hydrogen and alkyl groups of 1 to 4 carbon atoms; a, b, and d are each a positive number; and c is 0 or a positive number.

6,040,396

CURING CATALYSTS FOR CURING EPOXY RESINS

Joseph Gan, Strasbourg, France; Gabriele Badini, Sasbachwalden, and Klaus E. Hoffmann, Acheuu, both of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1997, Appl. No. 898,092

Int. Cl.[7] **C08F** *283/10*

U.S. Cl. 525—502 **17 Claims**

1. A process to make a curable formulation comprising the steps of:

(1) reacting an imidazole with an unsaturated compound, which contains at least one activated double bond, to form a nucleophilic addition adduct which contains more than one imidazole moiety per molecule; and

(2) preparing a formulation which contains the nucleophilic addition adduct and an epoxy resin, characterized in that fewer than 50 equivalent percent of the imidazole moieties in the nucleophilic addition adduct are neutralized with acid prior to step (2); wherein said adduct has a Mettler softening point of at least about 50° C. and a melt viscosity measured at 150° C. of at least about 90 mPa·s.

6,040,397

EXTREMELY LOW VISCOSITY MATRIX EPOXY SUFFUSION RESIN SYSTEM

James R. Hooper, Palmdale; Richard K. Strother, Valencia; John Fish, Canyon Country; Paul G. Pawling, Corona, and Gerald L. Sauer, Anaheim, all of Calif., assignors to Lockheed Martin Corporation, Palmdale, Calif.

Continuation-in-part of application No. 08/969,356, Nov. 28, 1997, abandoned. This application Jul. 6, 1998, Appl. No. 110,168.

Int. Cl.[7] **C08F** *283/10*

U.S. Cl. 525—526 **23 Claims**

1. An extremely low viscosity matrix epoxy suffusion resin system, comprising:

a) a suffusion resin composition comprising a polymeric epoxy resin a cycloaliphatic diepoxide, an aromatic poly epoxide, a chain extended epoxide resin and an epoxide resin said composition having a theoretical epoxide equivalent weight in the range of about 150 to about 350 and an anhydride curing agent having an approximate anhydride equivalent weight of about 120 to about 350, said resin composition combined with said curing agent in a mix ratio of about 100 parts by weight of said resin composition with about 45 to about 140 parts by weight of said curing agent to which has been added about 0.001 to about 6.5% parts by weight of an accelerator and about 0.001 to about 0.02 parts by weight of a substrate adhesion promoting agent, wherein said suffusion resin system has a viscosity of between about 50 cps and about 500 cps at 22 degrees C.

6,040,398

EPOXY CURING AGENT AND ONE-COMPONENT (TYPE) EPOXY RESIN COMPOSITION

Toshihiko Kinsho; Munekazu Satake, and Tadakazu Miyazaki, all of Kyoto, Japan, assignors to Sanyo Chemical Industries Ltd., Kyoto, Japan

Division of application No. 08/683,564, Jul. 12, 1996, Pat. No. 5,837,785. This application Sep. 2, 1998, Appl. No. 146,075.

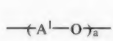
Claims priority, application Japan, Jul. 12, 1995, 7-200551; Nov. 8, 1995, 7-315996

Int. Cl.[7] **C08F** *283/000*

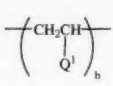
U.S. Cl. 525—527 **6 Claims**

1. A one-component epoxy resin composition comprising a polyepoxy compound and a heterocycle-containing compound having a structure represented by any of he following general formulae (2) through (9):

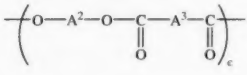
(2)



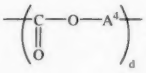
(3)



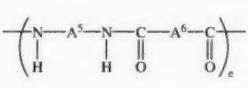
(4)



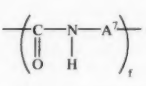
(5)



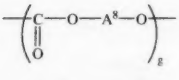
(6)



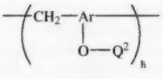
(7)



(8)

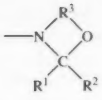


(9)



wherein in formula (2), "a" represents an integer of 3 to 200, A^1 represents at least one member selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group, arylalkylene group, haloalkylene group and a residue available on ring-opening polymerization of a glycidyl ether; wherein in formula —X—Z, X represents a divalent hydrocarbon group which may optionally have one or more linkages selected from the group consisting of ether, imino, amide, urethane, urea and sulfide linkages and Z represents a heterocyclic group of the formula (1):

(1)



wherein R_1 and R^2 may be the same or different and each represents hydrogen atom, straight-chain or branched C_1 to C_6 alkyl or alkenyl, or C_6 to C_0 aryl; or R^1 and R^2, taken together with the adjacent carbon atom, represents C_5 to C_7 cycloalkyl; R^3 represents C_1 to C_{10}, alkylene;

wherein at least three of A^1 in formula (2) represent alkylene group substituted by —X—Z;

wherein in formula (3), "b" represents an integer of 3 to 200, and Q^1 represents at least one member selected from the group consisting of hydrogen atom, alkyl group, aryl group, haloalkyl group, haloaryl group, alkoxycarbonyl group, acetoxy group and —X—Z;

wherein at least three of Q^1 in formula (3) represent —X—Z;

wherein in formula (4), "c" represents an integer of 2 to 200, and A^2 and A^3 may be the same or different and each represents at least one member selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^2 and A^3 in formula (4) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (5), "d" represents an integer of 3 to 200, and A^4 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^4 in formula (5) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (6), "e" represents an integer of 2 to 200, and A^5 and A^6 may be the same or different and each represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^5 and A^6 in formula (6) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (7), "f" represents an integer of 3 to 200, and A^7 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^1 in formula (7) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (8), "g" represents an integer of 3 to 200, and A^8 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^0 in formula (8) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (9), "h" represents an integer of 3 to 200, Ar represents aryl group, and Q^2 represents at least one species selected from the group consisting of hydrogen atom, epoxy group and —X—Z; and wherein at least three of Q^2 in formula (9) represent —X—Z.

6,040,399

PREPARATION METHOD OF ETHYLENE BASE POLYMER

Takashi Monoi; Masakazu Yamamoto; Hidenobu Torigoe, and Yasunori Takemoto, all of Oita, Japan, assignors to Japan Polyolefins Co., Ltd., Tokyo, Japan

PCT No. PCT/JP97/02881, § 371 Date Mar. 30, 1998, § 102(e) Date Mar. 30, 1998, PCT Pub. No. WO98/07762, PCT Pub. Date Feb. 26, 1998

PCT Filed Aug. 20, 1997, Appl. No. 43,872

Claims priority, application Japan, Aug. 21, 1996, 8-220208

Int. Cl.[7] C08F *4/22*

U.S. Cl. 526—106 **5 Claims**

1. A preparation method of an ethylene base polymer comprising a step of polymerizing ethylene in the presence of a catalyst comprising (1) an amide compound comprising a trivalent chromium atom, (2) a solid inorganic oxide calcined at 100 to 500° C. and (3) alumoxane.

6,040,400

ADDITION-CURABLE PERFLUORO COMPOUND-CONTAINING COMPOSITION

Kenichi Fukuda, Annaka, and Yasuo Tarumi, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1998, Appl. No. 168,376

Claims priority, application Japan, Oct. 9, 1997, 9-293401

Int. Cl.[7] C08F *16/24*

U.S. Cl. 526—126 **10 Claims**

1. An addition curable perfluoro compound-containing composition comprising:

(A) a linear perfluoro compound containing at least two alkenyl groups per molecule and having a perfluoro structure in its backbone chain,

(B) a linear perfluoro compound containing one alkenyl group per molecule and having a perfluoro structure in its backbone chain,

(C) an organosilicon compound containing at least two hydrosilyl groups per molecule, and

(D) a platinum family metal catalyst.

6,040,401

SATURATED TRICYCLIC LIGAND CONTAINING METAL COMPLEXES AND OLEFIN POLYMERIZATION PROCESS

Peter N. Nickias, Midland, Mich.; Tobin J. Marks, Evanston, Ill., and Yasushi Obora, Ibaraki, Japan, assignors to The Dow Chemical Company, Midland, Mich., and Northwestern University, Evanston, Ill.

Provisional application No. 60/023,608, Aug. 9, 1996. This application Aug. 1, 1997, Appl. No. 904,363.

Int. Cl.[7] C08F *4/44*

U.S. Cl. 526—160 **11 Claims**

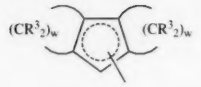
1. A metal complex corresponding to the formula:

$$L_1ZL_2MX_mX'_n$$

wherein:

M independently each occurrence is a metal of Group 4 of the Periodic Table of the Elements;

L_1 is a partially saturated tricyclic group that is bound to M by means of delocalized π-electrons, said group containing up to 50 nonhydrogen atoms and corresponding to the formula:



wherein R^3 independently each occurrence is hydrogen, or a silyl, hydrocarbyl or silyl-substituted hydrocarbyl group of up to 10 nonhydrogen atoms, and each w, independently, is a whole number from 4 to 6;

L_2 is a substituted cyclopentadienyl group that is bound to M by means of delocalized π-electrons, said cyclopentadienyl group being substituted at one and only one of its two distal positions with a bulky group, R^4, selected from the group consisting of C_{3-20} hydrocarbyl groups bonded to the cyclopentadienyl ring by means of a secondary or tertiary substituted carbon atom, and aryl groups of up to 20 carbons, said L_2group containing up to 50 nonhydrogen atoms;

Z is a divalent substituent bridging L_1 and L_2 of up to 50 non-hydrogen atoms having the formula, $—(ER^2_2)_m—$, wherein E independently each occurrence is carbon, silicon or germanium, R^2 independently each occurrence is selected from the group consisting of hydrocarbyl, hydrocarbyloxy, silyl, and germyl of up to 20 atoms other than hydrogen, and m is an integer from 1 to 3;

X each occurrence is a monovalent, anionic moiety having up to 40 non-hydrogen atoms, optionally, two X groups may be covalently bound together forming a divalent dianionic moiety having both valences bound to M, further optionally, 2 X groups may be covalently bound together to form a neutral, conjugated or nonconjugated diene that is bonded to M by means of delocalized π-electrons (whereupon M is in the +2 oxidation state), or still further optionally one or more X and one or more X' groups may be bonded together thereby forming a moiety that is both covalently bound to M and coordinated;

m is 1 or 2 and is equal to two less than the formal oxidation state of M, except when 2 X groups together form a neutral conjugated or non-conjugated diene that is π-bonded to M, in which case in is equal to the formal oxidation state of M,

X' is a neutral ligand having up to 20 non-hydrogen atoms other than a diene, and optionally X' and L_1 or X' and L_2 are covalently bonded together, and n is a number from 0 to 3.

6,040,402

POLYMERIC LIGANDS, POLYMERIC METALLOCENES, CATALYST SYSTEMS, PREPARATION, AND USE

Bernd Peifer, Bayreuth, Germany; Syriac J. Palackal; M. Bruce Welch, both of Bartlesville, Okla.; Helmut G. Alt, and Peter Schertl, both of Bayreuth, Germany, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of application No. 08/339,537, Nov. 15, 1994, Pat. No. 5,770,755. This application Mar. 26, 1998, Appl. No. 48,390.

Int. Cl.[7] **C08F** *4/44;4/02;4/60;* **B01J** *31/00;37/00*

U.S. Cl. 526—160 **13 Claims**

1. A polymerization process comprising contacting at least one olefin under polymerization conditions with a catalyst composition produced by combining an organoaluminoxane cocatalyst and a polymeric metallocene catalyst prepared by

(1) forming a fluorenyl-containing polymer by (a) polymerizing a 2-vinyl fluorene compound or (b) polymerizing a fluorene compound by reacting it with chloromethyl methyl ether in the presence of zinc dichloride or aluminum trichloride;

(2) reacting the fluorenyl-containing polymer with an alkali metal compound; and

(3) reacting the product of step (2) with a transition metal-containing compound.

6,040,403

NICKEL CATALYSTS FOR POLYMERIZATION

Karl-Heinz Aleksander Ostoja Starzewski, Bad Vilbel, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 11, 1997, Appl. No. 928,001

Claims priority, application Germany, Sep. 12, 1996, 196 37 019

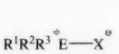
Int. Cl.[7] **C08F** *4/80;4/44;4/06;* **C07F** *15/00*

U.S. Cl. 526—171 **5 Claims**

1. A method for the polymerization of cycloolefins, which comprises polymerizing said cycloolefins in the presence of a catalyst which is a reaction product of

A. a nickel(0) compound or a compound which can be converted in situ into a nickel(0) compound, with, optionally,

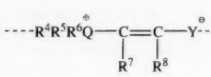
B. a compound of the formula



(I)

and (obligatorily)

C. a compound of the formula



(II)

where

R^1 to R^6 are, independently of one another, straight-chain or branched C_1–C_{20}-alkyl, C_1–C_{20}-alkoxy, C_3–C_8-cycloalkyl, C_2–C_{20}-alkenyl, di-(C_1–C_4-alkyl)amino, C_6–C_{12}-aryloxy, C_7–C_{15}-aralkyl, C_7–C_{15}-aralkoxy or C_6–C_{12}-aryl,

E and Q are, independently of one another, nitrogen, phosphorus, arsenic or antimony,

X is oxygen, sulphur, $=NR^9$, $=CR^9R^{10}$, $=C=C=O$, $=C=C=S$, $=C=PR^1R^2R^3$,

Y is oxygen or NR^9,

R^7, R^8 are, independently of one another, hydrogen, C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_1–C_{20}-alkoxy, C_3–C_8-cycloalkyl, C_6–C_{12}-aryl, C_6–C_{12}-aryloxy, C_6–C_{12}-ar-C_1– C_{20}-alkyl, C_6–C_{12}-ar-C_1–C_{20}-alkoxy, C_1–C_{20}-alkyl-C_6–C_{12}-aryl, C_1–C_{20}-alkyl-C_6– C_{12}-aryloxy, chlorine, cyano, NHR^{12}, NR^{12}_2, OR^{12}, $COOR^{12}$, $COOR^{11}$, $CONR^{12}$, COR^{12}, SR^{12}, SO_2R^{12}, OSO_2R^{12}, $P(O)(OR^{12})_{2-y}R^{13}_y$,

R^7 may also be SO_3R^{11} or

R^7 and R^8 together with the two carbon atoms to which they are bound form an isocyclic or heterocyclic ring,

R^9 and R^{10} are, independently of one another, R^1 or hydrogen, silyl, acyl, chlorophenyl, nitrophenyl, C_1–C_6-alkylphenyl, cyano, phenyl-C_2–C_6-alkenyl, silyl, trihalogenosilyl, tri-C_1–C_{30}-organosilyl, C_1–C_{16}-acyl, cyano, halogen, tri-C_1–C_{30}-organostannyl, $-BH_2$, di-C_1–C_{20}-organoboranyl, dihalogenoboranyl,

R^{11} is an alkali metal, thallium, 1/2 alkaline earth metal, ammonium, phosphonium, C_1–C_{12}-alkyl or C_6–C_{12}-aryl,

R^{12}, R^{13} are, independently of one another, C_1– C_{20}-alkyl, C_2–C_{20}-alkenyl, C_3–C_8-cycloalkyl or C_6–C_{12}-aryl and

y is zero, 1 or 2.

6,040,404

Patent Not Issued For This Number

6,040,405

BASE RESISTANT FLUORINATED POLYMERS

Paul Gregory Bekiarian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of application No. 08/973,382, Dec. 3, 1997, Pat. No. 5,852,150, Provisional application No. 60/000,062, Jun. 8, 1995. This application Oct. 23, 1998, Appl. No. 178,038.

Int. Cl.[7] **C08F** *214/26;* **C08L** *27/10*

U.S. Cl. 526—206 **15 Claims**

1. A polymer which is the product of free radically copolymerizing, in the presence of an organic iodide, a reaction mixture of monomers comprising tetrafluoroethylene, a compound of the formula CF_2=CFOR[1], wherein R^1 is an n-alkyl containing 1 to 6 carbon atoms, and, optionally, other free radically copolymerizable monomers, provided that:

said polymer contains about 0.1 to about 5 percent by weight of iodine; and

repeat unit (I), derived from tetrafluoroethylene, and repeat unit (II), derived from a compound of the formula CF_2=CFOR[1], are at least 50 mole percent of the repeat units of said polymer.

6,040,406

DETECTABLE WATER-TREATMENT POLYMERS AND METHODS FOR MONITORING THE CONCENTRATION THEREOF

Allen M. Carrier, Hixson, Tenn.; Robert W. R. Humphreys, Annandale, and Paul M. Petersen, Three Bridges, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation-in-part of application No. 08/465,165, Jun. 5, 1995, abandoned. This application Jan. 21, 1997, Appl. No. 786,171.

Int. Cl.[7] **C08F** *216/10;5/10;* **C08L** *29/00*

U.S. Cl. 526—238.22 **5 Claims**

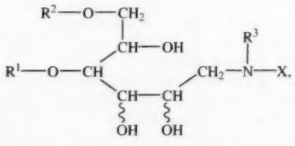
1. A water-treatment composition for use in the treatment of aqueous systems, said composition comprising,

a water-soluble polymer, said polymer comprising the polymerized residue of,

at least one water-treatment monomer in amounts effective to provide the polymer with the capability of performing at least one of a water-treatment function selected from the group consisting of dispersing particulate matter, inhibiting the formation of mineral scale, inhibiting the deposition of mineral scale and inhibiting corrosion in an aqueous system; and

a polymerizable, photo-inert, latently-detectable moiety represented by structure (III)

(III)



wherein, R^1 is selected from the group consisting of H, a monosaccharide, and a polysaccharide;

R^2 is selected from the group consisting of H, a monosaccharide, and a polysaccharide

wherein R^1 and R^2 are not both H, provided that if R^1 is H then R^2 is a polysaccharide, and if R^2 is H then R^1 is a polysaccharide; R^3 is C_1–C_{18} alkyl, H or NH_2, and X is the residue of a moiety selected from the group consisting of alpha-methyl stryl, acrylamide or methacrylamide,

said polymerizable, photo-inert, latently-detectable moiety being present in amounts effective to allow the water soluble polymer to be detected at concentrations of less than 100 parts per million and within a wavelength range of from 300 to 800 nanometers when the residue of the photo-inert, latently-detectable moiety is contacted with an amount of a photoactivator which is effective to cause the residue of the photo-inert, latently detectable moiety to absorb within said wavelength range.

6,040,407

CHAIN POLYENE GROUP-CONTAINING NORBORNENE COMPOUND AND UNSATURATED ETHYLENE COPOLYMER USING THE SAME

Tatsuyoshi Ishida; Masaaki Yasuda; Hitoshi Onishi; Noriaki Kihara; Toshiyuki Tsutsui, all of Yamaguchi; Toshihiro Sagane, Tokyo; Masaaki Kawasaki, and Hidenari Nakahama, both of Ichihara, all of Japan, assignors to Mitsui Petrochemical Industrial, Ltd., Tokyo, Japan

PCT No. PCT/JP95/02655, § 371 Date Jun. 26, 1997, § 102(e) Date Jun. 26, 1997, PCT Pub. No. WO96/20150, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 25, 1995, Appl. No. 860,442

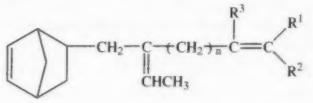
Claims priority, application Japan, Dec. 26, 1994, 6-322099; Mar. 31, 1995, 7-075288; May 25, 1995, 7-126535

Int. Cl.[7] **C08F** *10/02*

U.S. Cl. 526—281 **10 Claims**

1. A chain polyene group-containing norbornene compound represented by the formula (I):

(I)



wherein n is an integer of 1 to 5, R^1 is a hydrogen atom or an alkyl group of 1 to 5 carbon atoms, and R^2 and R^3 are each independently a hydrogen atom or an alkyl group of 1 to 5 carbon atoms, provided that R^1 and R^2 are not hydrogen at the same time.

3. An unsaturated ethylene copolymer wherein:

(A) said copolymer is a random copolymer of

(i) ethylene,

(ii) an α-olefin of 3 to 20 carbon atoms, and

(iii) at least one chain polyene group-containing norbornene compound represented by formula (I) of claim **1**;

(B) said copolymer comprises:

(i) constituent units derived from said ethylene in an amount of 30 to 92% by mol,

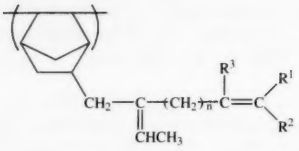
(ii) constituent units derived from said α-olefin of 3 to 20 carbon atoms in an mount of 6 to 70% by mol, and

(iii) constituent units derived from said chain polyene group-containing norbornene compound represented by formula (I) of claim **1** in an amount of 0.1 to 30% by mol, in which

(iv) the molar ratio of (i) said constituent units derived from said ethylene/(ii) said constituent units derived from said α-olefin of 3 to 20 carbon atoms is in the range of 40/60 to 92/8;

(C) said constituent unit derived from the chain polyene-group containing norbornene compound represented by formula (I) of claim **1** has a structure represented by the following formula:

(II)



wherein n is an integer of 1 to 5, R^1 is an alkyl group of 1 to 5 carbon atoms, and R^2 and R^3 are each independently a hydrogen atom or an alkyl group of 1 to 5 carbon atoms; and

(D) said copolymer has an intrinsic viscosity (η), as measured in Decalin at 135° C., of 0.05 to 10 dl/g.

6,040,408

RADIOPAQUE POLYMERS AND METHODS FOR PREPARATION THEREOF

Leo Hendrik Koole, Gulpen, Netherlands, assignor to Biomat B.V., Maastricht, Netherlands

PCT No. PCT/NL95/00277, § 371 Date Apr. 10, 1997, § 102(e) Date Apr. 10, 1997, PCT Pub. No. WO96/05872, PCT Pub. Date Feb. 29, 1996

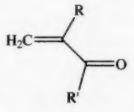
PCT Filed Aug. 21, 1995, Appl. No. 793,620

Claims priority, application European Pat. Off., Aug. 19, 1994, 94202363

Int. Cl.[7] C08F *18/00*

U.S. Cl. 526—292.1 **5 Claims**

1. A toy or bone cement being prepared from a radiopaque polymer, said polymer having an average molecular weight of at least 7500, and being substantially non-porous and having polymerized therein at least one monomer having at least one but not more that two covalently bound iodine groups, said monomer having the formula



wherein R═H, CH_3, C_2H_5, or another organic substituent, and R'═O—C_6H_4I, O—$C_6H_3I_2$, NH—C_6H_4I, NH—$C_6H_3I_2$, O—CH_2—CH_2 —C(O)—C_6H_4I, O—CH_2—CH_2—O—C(O)—$C_6H_3I_2$, NH—CH_2—CH_2—C(O)—C_6H_4I or NH—CH_2—CH_2—O—C(O)—$C_6H_3I_2$.

6,040,409

POLYMER COMPOSITIONS

Willie Lau, Ambler; Michael DeWayne Kelly, North Wales; Dennis Paul Lorah, Lansdale, and David Ralph Heinley, Schwenksville, all of Pa., assignors to Rohm and Haas Company, Phila., Pa.

Provisional application No. 60/047,261, May 21, 1997. This application May 7, 1998, Appl. No. 74,062.

Int. Cl.[7] C08F *20/10;120/10;220/10*

U.S. Cl. 526—328 **5 Claims**

1. An emulsion polymer composition comprising as polymerized units:

a) from 9.5 to 100 parts by weight of at least one C_{16} to C_{40} alkyl ester of (meth)acrylic acid;

b) from 0 to 90 parts by weight of at least one ethylenically unsaturated monomer;

c) from 0 to 90 parts by weight of at least one ethylenically unsaturated acid containing monomer or salts thereof, and

d) from 0 to 60 parts by weight of at least one alkali soluble resin; wherein the emulsion polymer composition is prepared by emulsion polymerization.

6,040,410

PROCESS FOR ALTERING THE VISCOSITY OF ORGANOPOLYSILOXANES

Otto Schneider, Burghausen, and Ralf Kratschmera, Burgkirchen, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Nov. 11, 1998, Appl. No. 189,554

Claims priority, application Germany, Dec. 19, 1997, 197 56 832

Int. Cl.[7] C08G *77/08*

U.S. Cl. 528—14 **15 Claims**

1. In a process for altering the viscosity of organopolysiloxanes by contacting the organopolysiloxanes with a viscosity-altering catalyst, the improvement comprising selecting as a catalyst, clay which has been treated with mineral acid and subsequently heated to from 250° C. to 1200° C.

6,040,411

LOW GLASS TEMPERATURE ORGANOSILOXANES

Norman Häberle, München; Franz-Heinrich Kreuzer, Martinsried, and Jürgen Küpfer, München, all of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Germany

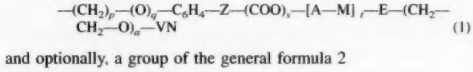
Filed Jun. 10, 1998, Appl. No. 90,025

Claims priority, application Germany, Jun. 19, 1997, 197 26 047

Int. Cl.[7] C08G *77/06*

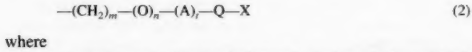
U.S. Cl. 528—26 **22 Claims**

1. An organosiloxane which comprises at least one group of the general formula 1



(1)

and optionally, a group of the general formula 2



(2)

where

X is a cholesteryl, dihydrocholesteryl, doristeryl, isosorbidyl, isomannidyl or cholic acid radical or an unsubstituted or substituted radical selected from 1,4-phenyl, 4,4'-biphenylyl, 1,4-cyclohexylene, 4,4'-bicyclohexylene, 4,4'-cyclohexylenephenylene, or 2,5-substituted 1,3-dioxanyl and pyrimidinyl radicals where the substituent is a C_1- to C_5-alkoxy radical, C_1- to C_5-alkyl radical, cyano radical, chloro radical, or nitro radical,

Q is a —COO— group or a —OOC— group or a —O— group or a chemical bond or a —O—(C═O)—O— group,

Z is a chemical bond or a group —CH_2— or —CH_2—CH_2—,

A is a 1,4-phenylene, 1,5-naphthylene, 2,6-naphthylene, 2,7-naphthylene, 4,4'-biphenylene, 1,4-cyclohexylene, 4,4'-bicyclohexylene, 4,4'-cyclohexylenephenylene, 2,5-(1,3-dioxanylene) or a pyrimidinylene radical,

M is a chemical bond, an oxygen atom, or a group —COO—, —OCO— or —OOC—$(CH_2)_v$—$COOCH_2CH_2$—,

VN is a group —COO—CH═CH_2, —COO—C(CH_3)═CH_2, —$(CH_2)_u$—O—CH═CH_2, —CH═CH_2, or an oxiranyl group,

E is a group $(CH_2)_r$, where individual CH_2 groups can be replaced by oxygen,

m and p are each integers from 3 to 6,

r is 0 or an integer from 1 to 10,

n, q and s are each 0 or 1,

t is 0 or an integer from 1 to 3,

u and v are each an integer from 2 to 8, and

a is 0 or an integer from 1 to 6, with the proviso that in the groups of the general formulae 1 and 2 no oxygen atoms are attached directly to one another

wherein at least one of E or $-(CH_2CH_2O)-$ is present.

5. A process for preparing an organosiloxane as claimed in claim **1**, in which organosiloxanes composed of units of the general formula 6

$$[R_bH_cSiO_{(4-b-c)/2}] \quad (6)$$

in which R are C_1–C_4 alkyl radicals, b is 0, 1, or 2, and c is 0 or 1 are reacted with a mixture of compounds of the general formulae 4 and, optionally, 7

$$H_2C{=}CH{-}(CH_2)_{p-2}{-}(O)_q{-}C_6H_4{-}Z{-}(COO)_s{-}[A{-}M]_t{-}E{-}(CH_2{-}CH_2{-}O)_u{-}VN \quad (4)$$

$$H_2C{=}CH{-}(CH_2)_{m-2}{-}(O)_n{-}(A)_t{-}Q{-}X \quad (7)$$

in which

Z, A, E, M, VN, Q, m, n, p, q, s, t and a are as defined for the general formulae 1 and 2, with the proviso that in the compounds of the general formulae 4 and 7 no oxygen atoms are attached directly to one another.

6,040,412

PROCESS FOR PREPARING CHAIN-EXTENDED ORGANOPOLYSILOXANES

Eric Damme, Brussels, Belgium; Jean-Marc Gilson, Midland, Mich.; Patrick Leempoel, Brussels, Belgium; Fabrice Lebecq, Midland, Mich., and Takao Takemasa, Chiba, Japan, assignors to Dow Corning S.A., Seneffe, Belgium

Filed Oct. 14, 1998, Appl. No. 172,508

Int. Cl.[7] **C08G** *77/04*

U.S. Cl. 528—34 **14 Claims**

1. A process for preparing chain-extended organopolysiloxanes which comprises the steps of:

A) mixing organopolysiloxanes having at least one silicon-bonded hydroxyl group per molecule with a polymerization catalyst to form a mixture;

B) allowing the mixture of step A to react so as to produce a reaction product comprising polymerized organopolysiloxanes of which some have at least one silicon-bonded hydroxyl group per molecule; and

C) allowing the silicon-bonded hydroxyl group containing organopolysiloxanes of the reaction product of step B to react with a nitrogen-containing silylating agent capable of chain-extension to produce a chain-extended organopolysiloxane.

6,040,413

COMPOSITION OF POLYTETRAMETHYLENE ETHER GLYCOLS AND POLYOXY ALKYLENE POLYETHER POLYOLS HAVING A LOW DEGREE OF UNSATURATION

Thomas L. Fishback, Gibraltar; Duane A. Heyman, Monroe; Curtis J. Reichel, Southgate, all of Mich., and Adam J. Jaglowski, Fall River, Mass., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Jul. 10, 1996, Appl. No. 678,001

Int. Cl.[7] **C08G** *18/10*

U.S. Cl. 528—44 **21 Claims**

1. A polyol composition for use as a polyol component to react with one or more polyisocyanates in the production of a polyurethane elastomer consisting essentially of:

(A) polyoxytetramethylene ether glycol, and

(B) a trifunctional active hydrogen compound-initiated polyoxyalkylene polyether polyol having a degree of unsaturation of between 0.04 milliequivalents per gram and 0.02 milliequivalents per gram of said polyether polyol, said polyoxyalkylene polyether polyol capped with oxyalkylene groups derived from ethylene oxide in an amount of from 4 weight percent to 30 weight percent based on the weight of all oxyalkylene groups.

6,040,414

COATINGS FOR COILS

Tatiana Temtchenko, Alessandria, and Massimo Malavasi, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Jun. 10, 1997, Appl. No. 872,502

Claims priority, application Italy, Apr. 17, 1997, MI96A1177

Int. Cl.[7] **C08G** *18/50*

U.S. Cl. 528—70 **17 Claims**

1. A process for coating coils with crosslinkable compositions comprising blocked isocyanates and (per)fluoropolyetheral polymers having an average number molecular weight of between 500 and 5000 and hydroxyl bifunctional termination and having improved stain release properties, no dirt pick-up and resistance to pressure marking and to hostile environments, said (per)fluoropolyetheral polymers comprising repeating units selected from the group consisting of:

a) $-(C_3F_6O)_{m'}(CFYO)_{n'}-$ wherein the unit (C_3F_6O) and (CFYO) are perfluorooxyalkylenic units statistically distributed along the chain; m' and n' are integers such as to give the molecular weight indicated above, and the ratio m'/n' between 5 and 40, when n' is different from 0; Y is equal to F or CF_3; n' can also be 0; said units can be linked to each other by a bridge bond —O—R'_f—O—, wherein R'_f has the meaning defined in c) hereunder;

b) $-(C_2F_4O)_{p'}(CFYO)_{q'}(C_3F_6O)_{t'}-$ wherein p' and q' are integers such that p'/q' ranges between 5 and 0.3, and such that the molecular weight is that indicated above; t' being an integer with the meaning of m', Y=F or CF_3; t' can be 0 and q'/q'+p'+t' lower than or equal to 1/10 and the t'/p' ratio is from 0.2 to 6;

c) $-CR_4R_5CF_2CF_2O-$ wherein R_4 and R_5 are equal to or different from each other and chosen from H, Cl, F or perfluoroalkyl 1–4 C atoms, the molecular weight being that indicated above, said unit inside the fluoropolyoxyalkylenic chain being linked to each other as follows:

$$-(OCR_4R_5CF_2CF_2)_{p'}-O-R'_f-O-(CR_4R_5CF_2CF_2O)_{q'}-$$

wherein R'_f is a fluoroalkylenic group from 1 to 4 C, and p+q is at least 1 and such that the molecular weight is that indicated above,

d) $-(CF(CF_3)CF_2O-$ said units being linked each other inside the fluoropolyoxyalkylenic chain as follows:

$$-(OCF_2CF(CF_3))_{a'}O-CF_2(R'_f)_xCF_2-O-(CF(CF_3)CF_2O)_{b'}-$$

wherein R'_f has the meaning indicated above, x is 0 or 1, a and b are integers and a+b is at least 1 and such that the molecular weight is that indicated above, and

e) $-(C_2F_4O)_{a'}(CFYO)_{b'}-$ wherein a' and b' are integers such that the molecular weight is within the range indicated, a'/b' ranges between 5 and 0.3, Y has the meaning indicated above, having hydroxyl bifunctional termination;

said process comprising coating coils with said composition, and crosslinking said polymers, said crosslinking being carried out with the blocked isocyanates having at least three NCO groups.

6,040,415
BIOCOMPATIBLE POLYMERS

Susumu Arimori; Masahiro Seko; Masakazu Tanaka; Noriko Monden, and Hideyuki Yokota, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

PCT No. PCT/JP98/01702, § 371 Date Dec. 15, 1998, § 102(e) Date Dec. 15, 1998, PCT Pub. No. WO98/46659, PCT Pub. Date Oct. 22, 1998

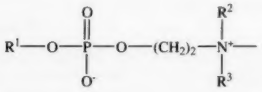
PCT Filed Apr. 13, 1998, Appl. No. 147,392

Claims priority, application Japan, Apr. 17, 1997, 9-100446; Jun. 30, 1997, 9-174549; Dec. 15, 1997, 9-345351

Int. Cl.[7] **C08G** *18/32;18/38;* **A61K** *31/765;31/785;31/80*

U.S. Cl. 528—71 **14 Claims**

1. A biocompatible polyurethane or polyurethane urea having side chains which comprise a phosphorylcholine structure represented by the formula (1):



(1)

wherein R^1 is C_{1-20} alkyl, C_{6-12} aryl, C_{7-20} aralkyl, or a group of the formula:

$$R^4—(A)_n—$$

wherein A is C_{2-10} oxyalkylene, and $(A)_n$ is constituted of one kind of oxyalkylene groups or of two or more kinds of oxyalkylene groups linked together in blocks or at random; n is an integer of 1 to 30; and R^4 is C_{1-20} alkyl, C_{6-12} aryl or C_{7-20} aralkyl; and R^2 and R^3 each represent C_{1-20} alkyl, C_{6-12} aryl or C_{7-20} aralyky, and are the same or different.

6,040,416
MELT POLYMER SYNTHESIS OF POLY ETHER PHOSPHINE OXIDES

Venkateshwaran N. Sekharipuram, Roanoke; Beverly Sue Mecham, Blacksburg; Atul Bhatnagar, Roanoke, and James E. McGrath, Blacksburg, all of Va., assignors to Johnson & Johnson Vision Products, Inc., Roanoke, and Virginia Tech Intellectual Properties, Inc., Blacksburg, both of Va.

Filed Feb. 18, 1999, Appl. No. 252,296

Int. Cl.[7] **C08G** *79/02*

U.S. Cl. 528—168 **17 Claims**

1. A method for producing a poly ether phosphine oxide, said method comprising melt polymerizing reactants comprising

(i) a trimethyl silyl derivative of a bisphenol and (ii) an activated aromatic dihalide, wherein (i), (ii), or (i) and (ii) is a phosphine oxide.

6,040,417
PROCESS FOR PREPARING POLYETHYLENE NAPHTHALATE BASED POLYMERS

Hyun Nam Cho, 33/9, 2-38, Shingil-Dong, Yongdungpo-ku; Jae Min Hong, 159-4, Anam-Dong 5-Ka, Sungbook-Ku; Young Chan Ko, Hyundai Apt. 53-501, 462, Apkujung-Dong, Kangnam-Ku, all of Seoul; Il Seok Choi, Bagsongmaeul 102-501, 1187, Bagseok-Dong, Ilsan-Ku, Koyang Kyungki-Do, and Young Jin Heo, Hyundai Apt. 102-1701, 234, Hwayang-Dong, Kwangjin-Ku, Seoul, all of Rep. of Korea

Filed Sep. 14, 1999, Appl. No. 396,490

Claims priority, application Rep. of Korea, Feb. 24, 1999, 99-6107

Int. Cl.[7] **C08G** *63/78;63/02*

U.S. Cl. 528—279 **16 Claims**

1. A process for preparing polyethylene naphthalate polymers comprising the steps of:

(a) esterifying a dicarboxylic acid containing 2,6-NDCA, dicarboxylic ester containing 2,6-NDC or derivatives thereof and ethylene glycol or glycol containing ethylene glycol to produce esterification polymers containing bis(beta-hydroxyethyl)naphthalate;

(b) polycondensing continuously the resultant esterification polymers of step (a) to produce polymers of polyethylene naphthalate; and,

wherein the above process includes using a composite polymerization catalyst comprising at least one compound of titanium and at least one compound of aromatic phosphite, and the titanium compound represented by formulas I or II:

$$(RO)_4Ti, \qquad \text{Formula I}$$

$$(RO)_4Ti.2XP(O)(OR')_2 \qquad \text{Formula II}$$

R and R' are the same or different and are selected from the group consisting of a methyl group, an ethyl group, an n-propyl group, an isopropyl group, an n-butyl group, an isobutyl group, a sec-butyl group, a tert-butyl group, an n-amyl group, an acetylisopropyl group, a pentyl group, a hexyl group, a heptyl group, a 2-ethylhexyl group, an octyl group, a decyl group, a dodecyl group, a tridecyl group, an octadecyl group, a stearyl group, an allyl group, a 2,2-diallyloxymethylbutyl group, a cyclopentyl group, a cyclohexyl group, a naphthyl group, a phenyl group, a benzyl group, and a dodecylbenzyl group, and X represents a hydrogen group, a halogen group, an alkyl group, an alkoxy group or an aryloxy group.

6,040,418
FLUORINATED POLYIMIDES, LAMINATED SUBSTRATES AND POLYAMIC ACID SOLUTIONS

Tomohiko Yamamoto; Tatsuo Tsumiyama, and Kouji Sugimoto, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 4, 1998, Appl. No. 128,665

Claims priority, application Japan, Aug. 5, 1997, 9-210606

Int. Cl.[7] **C08G** *73/10*

U.S. Cl. 528—353 **11 Claims**

1. A fluorinated polyimide consisting essentially of one or more aromatic tetracarboxylic acid components and one or more aromatic diamine components, said aromatic tetracarboxylic acid components being derived from more than 50% by mole of 2,2',5,5',6,6'-hexafluorobiphenyl-3,3',4,4'-tetracarboxylic dianhydride or a mixture of 2,2',5,5',6,6'-hexafluorobiphenyl-3,3',4,4'-tetracarboxylic dianhydride and 4,2',5,5',6,6'-hexafluorobiphenyl-2,3,3',4'-tetracarboxylic dianhydride and not more than 50% by mole of at least one member selected from the group consisting of 3,3',4,4'-benzophenonetetracarboxylic, dianhydride, 3,3',4,4'-biphenyltetracarboxylic dianhydride, 2,3,3',4'-biphenyltetracarboxylic dianhydride, 3,3',4,4'-diphenylether tetracarboxylic dianhydride, bis(3,4-dicarboxyphenyl)methane, 2,2-bis(3,4-dicarboxyphenyl)propane and pyromellitic dianhydride, and said aromatic diamine components being derived from at least one member selected from the group consisting of m-phenylenediamine, o-phenylenediamine, p-phenylenediamine, benzidine, 3,3'-diaminodiphenyl ether, 3,4'-diaminodiphenyl ether, 4,4'-diaminodiphenyl ether, 3,3'-diaminodiphenyl sulfide, 3,4'-diaminodiphenyl sulfide, 4,4'-diaminodiphenyl sulfide, 3,3'-diaminodiphenyl sulfone, 3,4'-diaminodiphenyl sulfone, 4,4'-diaminodiphenyl sulfone, 3,3'-diaminobenzophenone, 3,4'-diaminobenzophenone, 4,4'-diaminobenzophenone, 3,3'-diaminodiphenylmethane, 3,4'-diaminodiphenylmethane, 4,4'-diaminodiphenylmethane, 2,2-bis(4-aminophenyl)propane, 2,2-bis(3-aminophenyl)propane, 2-(3-aminophenyl)-2-(4-aminophenyl)propane, 2,2-bis(4-aminophenyl)-1,1,1,3,3,3-hexafluoropropane, 2,2-bis(3-aminophenyl)-1,1,1,3,3,3-hexafluoropropane, 2-(3-aminophenyl)-2-(4-aminophenyl)-1,1,1,3,3,3-hexafluoropropane, 1,3-bis(3-aminophenxoy)benzene, 1,3-bis(4-aminophenxoy)benzene, 1,4-bis(3-aminophenoxy)benzene, 1,4-bis(4-aminophenoxy)benzene, 1,3-

bis(3-aminobenzoyl)benzene, 1,4-bis(3-aminobenzoyl)benzene, 1,3-bis(4-aminobenzoyl)benzene, 1,4-bis(4-aminobenzoyl)benzene, 3,3'-diamino-4-phenoxybenezophenone, 4,4'-diamino-5-phenoxybenzophenone, 3,4'-diamino-4-phenoxybenzophenone, 3,4'-diamino-5-phenoxybenzophenone, 4,4'-bis(4-aminophenoxy)biphenyl, 3,3'-bis(4-aminophenoxy)biphenyl, 3,4'-bis(3-aminophenoxy)biphenyl, bis[4-(4-aminophenoxy)phenyl]ketone, bis[4-(3-aminophenoxy)phenyl]ketone, bis[3-(4-aminophenoxy)phenyl]ketone, bis[3-(3-aminophenoxy)phenyl]ketone, 3,3'-diamino-4,4'-diphenxoydibenzophenene, 4,4'-diamino-5,5'-diphenoxybenzophenone, 3,4'-diaamino-4,5'-diphenoxybenzophene, bis(4-(4-aminophenoxy)phenyl] sulfide, bis[3-(4-aminophenoxy)phenyl] sulfide, bis[4-(3-aminophenoxy)phenyl] sulfide, bis[3-(3-aminophenoxyl)phenyl] sulfide, bis[3-(4-aminophenoxyl) phenyl] sulfone, bis[4-(4-aminophenoxy)phenyl] sulfone, bis[3-(3-aminophenoxy)phenyl] sulfone, bis[4-(3-aminophenoxy)phenyl] sulfone, bis[4-(3-aminophenoxyl)phenyl] ether, bis[4-(4-aminophenoxy)phenyl] ether, bis[3-(3-aminophenoxy)phenyl] ether, bis[4-(3-aminophenoxy)phenyl]methane, bis[4-4-aminophenoxy)phenyl]methane, bis[3-(3-aminophenxoy)phenyl]methane, bis[3-(4-aminophenoxy)phenyl]methane, 2,2-bis[4-(3-aminophenoxy)phenyl]propane, 2,2-bis[4-(4-aminophenoxy)phenyl]propane, 2,2-bis[3-(3-aminophenoxy)phenyl]propane, 2,2-bis[4-(3-aminophenoxy)phenyl]-1,1,1,3,3,3-hexafluoropropane, 2,2-bis[4-4-aminophenoxy)phenyl]-1,1,1,3,3,3-hexafluoropropane, 2,2-bis[3-(3-aminophenoxy)phenyl]-1,1,1,3,3,3-hexafluoropropane, 2,2-bis[3-(4-aminophenoxy)phenyl]-1,1,1,3,3,3-hexafluoropropane, 1,4-bis[4-(3-aminophenoxy)benzoyl]benzene, 1,3-bis[4-(3-aminophenoxy)benzoyl]benzene, 1,3-bis(3-amino-4-phenoxybenzoyl)benzene, 1,4-bis(3-amino-4-phenoxybenzoyl)benzene, 1,3-bis(4-amino-5-phenoxybenzoyl)benzene, 1,3-bis(4-amino-5-biphenoxybenzoyl)benzene, 1,4-bis(4-amino-5-biphenoxybenzoyl)benzene, 1,3-bis(3-amino-4-biphenoxylbenzoyl)benzene, 1,4-bis(3-amino-4-biphenoxybenzoyl)benzene, 1,4-bis[4-(4-aminophenoxy)-α,α-dimethylbenzyl]benzene, 1,3-bis[4-(4-aminophenoxy)-α,α-dimethylbenzyl]benzene, 1,3-bis[4-(4-amino-6-trifluoromethylphenoxy)-α,α-dimethylbenzyl]benzene, 1,3-bis[4-(4-amino-6-fluoromethylphenoxy)-α,α-dimethylbenzyl]benzene, 1,3-bis[4-(4-amino-6-methylphenoxy)-α,α-dimethylbenzyl]benzene and 1,3-bis[4-(4-amino-6-cyanophenoxy)-α,α-dimethylbenzyl]benzene.

6,040,419
PROCESS FOR THE POLYMERIZATION OF CYCLIC ETHERS

Neville Everton Drysdale, Newark; Lin Wang, Hockessin, and Zhen-Yu Yang, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US97/00930, § 371 Date Jul. 20, 1998, § 102(e) Date Jul. 20, 1998, PCT Pub. No. WO97/27238, PCT Pub. Date Jul. 31, 1997

Provisional application No. 60/010,515, Jan. 24, 1996. This PCT application Jan. 22, 1997, Appl. No. 101,905.

Int. Cl.[7] **C08G** *59/68*

U.S. Cl. 528—408 **19 Claims**

1. A process for polymerizing a cyclic ether in the presence of a strong Bronsted acid catalyst, which comprises polymerizing a cyclic ether in the presence of a fluorinated sulfonic acid-containing polymer as the strong Bronsted acid containing at least about 0.05 equivalents of fluorinated sulfonic acid group per kg of said fluorinated sulfonic acid containing polymer; containing more hydrogen atoms bound to carbon than fluorine atoms bound to carbon; and said fluorinated sulfonic acid is contained within the grouping $—CR^1R^2CR^3R^4SO_3H$ wherein R^1, R^2, R^3, and R^4 are each independently fluorine or perfluoroalkyl.

6,040,420
POLYFORMAMIDES AND POLYAMINES

Klaus Ebel, Lampertheim, and Hans-Joachim Hähnle, Neustadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of application No. 08/839,801, Apr. 18, 1997. This application Feb. 8, 1999, Appl. No. 246,870.

Claims priority, application Germany, Apr. 19, 1996, 196 15 485

Int. Cl.[7] **C08F** *6/00;20/00;8/00;120/00;* **C08L** *79/02*

U.S. Cl. 528—480 **20 Claims**

1. A process for the preparation of a polyamine, which process comprises

i) catalytically reacting a polymer comprising nitrile-containing repeating units in the presence of hydrogen and carbon monoxide and/or carbon monoxide-releasing compounds to give a polymer comprising N-substituted formamide structural units, and

ii) hydrolyzing the polymer comprising N-substituted formamide structural units resulting from the catalytic reaction (i) to give the polyamine.

6,040,421
ESCHERICHIA COLI O157:H7 EPITHELIAL ADHESION AND VACCINE

Phillip I. Tarr, Seattle; Sima S. Bilge, Bellevue, both of Wash.; Thomas E. Besser, Moscow, Id., and James C. Vary, Jr., Seattle, Wash., assignors to Children's Hospital and Medical Center; University of Washington, both of Seattle, and University Research Foundation, Pullman, all of Wash.

Division of application No. 08/765,081, filed as application No. PCT/US95/06994, Jun. 7, 1995, Pat. No. 5,798,260, which is a continuation-in-part of application No. 08/265,714, Jun. 24, 1994, abandoned. This application Jun. 16, 1998, Appl. No. 98,082.

Int. Cl.[7] **A61K** *38/00;39/02;39/108;39/00;* **C07C** *245/00*

U.S. Cl. 530—300 **2 Claims**

1. An isolated peptide comprising the amino acid sequence of SEQ ID NO:5.

6,040,422
SYNTHESIS AND USE OF AMINO ACID FLUORIDES AS PEPTIDE COUPLING REAGENT

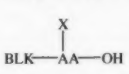
Louis A. Carpino, and Ayman Ahmed El-Faham, both of Amherst, Mass., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Division of application No. 08/466,319, Jun. 6, 1995, Pat. No. 5,750,767, which is a continuation of application No. 08/284,964, Aug. 2, 1994, Pat. No. 5,712,418, which is a continuation-in-part of application No. 07/426,121, Oct. 23, 1989, Pat. No. 5,360,928. This application Jan. 5, 1998, Appl. No. 2,860.

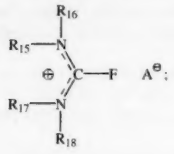
Int. Cl.[7] **C07K** *1/08*

U.S. Cl. 530—333 **23 Claims**

1. A process for forming a peptide bond between a first amino acid having a free amino group and a protected carboxy group and a second amino acid or between a peptide having a free amino group and a protected carboxy group with a second amino acid which comprises (a) reacting the second amino acid of the formula:



with a fluoroformamidinium salt of the formula:



and (b) reacting the product of (a) with the first amino acid or peptide wherein

AA is an amino acid residue;

BLK is a N-amino protecting group;

X is absent or is a protecting group on the side chain of the second amino acid;

R_{15}, R_{16}, R_{17} and R_{18} are independently lower alkyl, aryl, aryl lower alkyl, cycloalkyl, cycloalkyl lower alkyl or

R_{15} and R_{16} taken together with the nitrogen atom to which they are attached form a 5- or 6-membered ring containing a nitrogen ring atom and 4 or 5 carbon ring atoms and up to total of 10 carbon atoms, or

R_{17} and R_{18} taken together with the nitrogen atom to which they are attached form a 5- or 6-membered ring containing a nitrogen ring atom and 4–5 ring carbon atoms and up to a total of 10 carbon atoms or

R_{16} and R_{17} taken together with the nitrogen atoms to which they are attached and the carbon atom attached to said nitrogen atoms form a 5- or 6-membered ring containing 2 nitrogen ring atoms and 3–4 ring carbon atoms and up to a total of 10 carbon atoms and

A is a counterion.

6,040,423

PROCESS FOR SYNTHESIS OF PEPTIDES

Ronald Frank, and Sinan Guler, both of Braunschweig, Germany, assignors to Gsellschaft fur Biotechnologische Forschung mbH (GBF), Braunschweig, Germany

PCT No. PCT/EP91/01529, § 371 Date Mar. 22, 1993, § 102(e) Date Mar. 22, 1993, PCT Pub. No. WO92/04366, PCT Pub. Date Mar. 19, 1992

PCT Filed Aug. 31, 1990, Appl. No. 978,674

Claims priority, application Germany, Aug. 31, 1990, P 40 27 675/9

Int. Cl.[7] C07K *1/04*

U.S. Cl. 530—334 **18 Claims**

1. A spotting method for the rapid synthesis of a plurality of peptides, said peptides differing from spot to spot from each other in the sequence of amino acid residues making up the peptides, which comprises;

providing a single, unitary, solid phase support having a planar surface, said surface bearing chemically reactive groups to which the C-terminal of a peptide under synthesis can be covalently bonded;

covalently bonding to the reactive groups in freely selected discrete spotting zones, a starting amino acid residue of the sequence of each peptide to be synthesized by wetting each freely selected discrete spotting zone with a small aliquot of a solution of an N-protected derivative of the starting amino acid residue, and

synthesizing the different peptides by coupling additional amino acid residues to the starting amino acid residue, in a predetermined sequence, by wetting each discrete spotting zone with small aliquots of solutions of N-protected derivatives of the amino acids according to said predetermined sequence,

whereby there is obtained a unitary, single solid phase support bearing a plurality of different, bound peptides.

6,040,424

PROTEIN AND GENE FOR ANTIOXIDANT RESPONSE

William E. Fahl, and Wyeth W. Wasserman, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 19, 1996, Appl. No. 686,617

Int. Cl.[7] C07K *14/435*

U.S. Cl. 530—350 **2 Claims**

1. A preparation comprising human ARE-BP-1 protein purified from a host cell.

6,040,425

MYC HOMOLOGY REGION II—ASSOCIATED PROTEIN

Ronald A. DePinho, Pelham Manor, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Filed Oct. 8, 1997, Appl. No. 946,692

Int. Cl.[7] C07K *14/47;* **A61K** *38/17*

U.S. Cl. 530—350 **1 Claim**

1. A purified protein characterized as (i) comprising amino acid sequence of FIG. 7(*b*) (SEQ ID NO:4), (ii) having an apparent molecular weight of about 40–50 kDa as determined by SDS/PAGE and (iii) binding to Myc homology region II (MHRII), wherein MHRII comprises amino acids 104–140 of c-Myc.

6,040,426

HUMAN TH2 SPECIFIC PROTEIN

Kazuyuki Ogawa; Kazuya Tanaka; Kinya Nagata, and Syoichi Takano, all of Saitama, Japan, assignors to BML, Inc., Tokyo, Japan

PCT No. PCT/JP97/01906, § 371 Date May 11, 1998, § 102(e) Date May 11, 1998, PCT Pub. No. WO97/46677, PCT Pub. Date Dec. 11, 1997

PCT Filed Jun. 5, 1997, Appl. No. 981,825

Claims priority, application Japan, Jun. 5, 1996, 8-166793

Int. Cl.[7] C07K *14/435*

U.S. Cl. 530—350 **1 Claim**

1. A human-Th2-specific protein comprising an amino acid sequence set forth in sequence ID No. 6.

6,040,427

VACCINE

Camille Locht, Wannehaing, France, and Yves Lobet, Rixensart, Belgium, assignors to SmithKline Beecham Biologicals, Rixensart, Belgium

Division of application No. 08/763,460, Dec. 11, 1996, Pat. No. 5,786,189, which is a continuation of application No. 08/245,848, May 19, 1994, abandoned, which is a continuation of application No. 07/852,212, filed as application No. PCT/EP90/02034, Nov. 26, 1990, abandoned, which is a continuation-in-part of application No. 07/455,648, Dec. 22, 1989, abandoned, which is a continuation-in-part of application No. 07/442,808, Nov. 29, 1989, abandoned. This application Jul. 1, 1998, Appl. No. 108,565.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] C12N *15/11;15/31;15/70;15/90;* **A61K** *39/10*

U.S. Cl. 530—350 **20 Claims**

1. An isolated DNA molecule comprising a recombinant coding sequence encoding a *Bordetella pertussis* holotoxin comprising a modified B-oligomer comprising either or both of a modified dimer D1or D2 wherein said modified dimer comprises an unmodified S4 subunit and either a modified S2 subunit or a modified S3 subunit and said modified B-oligomer optionally comprises an unmodified S5 subunit and further optionally comprises an unmodified S1 subunit, wherein said holotoxin comprising a modified B-oligomer is specifically reactive with antisera capable of recognizing a wild-type *Bordetella pertussis* holotoxin having no modified subunits;

wherein said modified S2 subunit comprises one or more amino acid sequence modifications selected from the group consisting of a deletion of one or more of Tyr^{102}, Tyr^{103} and Asn^{105}, an amino acid substitution of either or both of Tyr^{102} and Tyr^{103} and a substitution of a negatively-charged amino acid for Asn^{105}; and

wherein said modified S3 subunit comprises one or more amino acid sequence modifications selected from the group consisting of a deletion of one or more of Tyr^{102}, Tyr^{103} and Lyr^{105}, an amino acid substitution of either or both of Tyr^{102} and Tyr^{103}, and a substitution of a negatively-charged amino acid for Lys^{105}.

6,040,428

PORCINE E-SELECTIN

Scott Rollins, Monroe; Russell P. Rother, Cheshire; Louis A. Matis, Southport, and Mark J. Evans, Cheshire, all of Conn., assignors to Alexion Pharmaceuticals, Inc., New Haven, Conn.

Division of application No. 08/252,493, Jun. 1, 1994, Pat. No. 5,891,645. This application Mar. 25, 1999, Appl. No. 276,197.

Int. Cl.[7] **C07K** *14/47*

U.S. Cl. 530—350 **3 Claims**

1. An isolated porcine E-selectin produced by a method comprising growing a recombinant host cell containing an isolated nucleic acid molecule comprising:

(a) a nucleic acid molecule encoding amino acid 1 through amino acid 405 of SEQ ID NO:9; or

(b) a nucleic acid molecule encoding amino acid 1 through amino acid 462 of SEQ ID NO:9,

such that the protein encoded by the nucleic acid molecule is expressed by the host cell, and isolating the expressed porcine E-selectin.

6,040,429

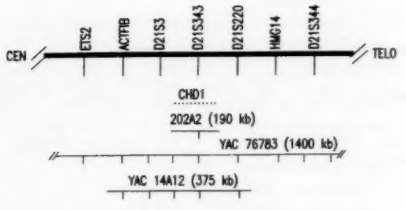
CONGENITAL HEART DISEASE PROTEINS AND PRODUCTS RELATED THERETO

Julie R. Korenberg, Los Angeles, Calif., assignor to Cedars-Sinai Medical Center, Los Angeles, Calif.

Division of application No. 08/927,307, Sep. 11, 1997, Pat. No. 5,945,305, Provisional application No. 60/026,314, Sep. 19, 1996. This application Aug. 30, 1999, Appl. No. 385,947.

Int. Cl.[7] **C07K** *14/00;* **C12N** *15/00;* **C12P** *21/00;* **C07H** *21/04*

U.S. Cl. 530—350 **9 Claims**



1. An isolated polypeptide consisting of the amino acid sequence of SEQ ID NO:2.

6,040,430

NUCLEIC ACID ENCODING SITE SPECIFIC RECOMBINASE AND NUCLEAR RECEPTOR FUSION PROTEIN

Francis Stewart, Gaiberg, Germany, assignor to European Molecular Biology Laboratory (EMBL), Heidelberg, Germany

PCT No. PCT/EP94/02088, § 371 Date Dec. 26, 1995, § 102(e) Date Dec. 26, 1995, PCT Pub. No. WO95/00555, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 28, 1994, Appl. No. 564,264

Claims priority, application European Pat. Off., Jun. 28, 1993, 93110298

Int. Cl.[7] **C07K** *14/435;14/705;* **C12N** *15/12;15/62*

U.S. Cl. 530—358 **15 Claims**

1. A fusion protein, comprising (1) a site specific recombinase protein and (2) the ligand binding domain of a nuclear receptor which is attached at the C- or N-terminus of said site specific recombinase protein, such that, in a cell or cell-free system containing DNA target sites which are specifically recognized by said site specific recombinase protein:

(a) site specific recombinase activity of said fusion protein in relation to the DNA target sites is inhibited in the absence of ligand binding to said ligand binding domain, and

(b) inhibition of said site specific recombinase activity of said fusion protein in relation to the DNA target sites is relieved by binding of ligand to said ligand binding domain.

6,040,431

SINGLE CHAIN ANALOGS OF THE TGF-β SUPERFAMILY (MORPHONS)

Peter C. Keck, Millbury, and John E. Smart, Weston, both of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Jun. 7, 1995, Appl. No. 478,097

Int. Cl.[7] **C12N** *15/12;* **C07K** *14/51*

U.S. Cl. 530—399 **9 Claims**

1. A biosynthetic single-chain protein comprising:

a single polypeptide chain defined by a formula selected from the group consisting of:

(a) F1-L-F2-L-H;

(b) F1-L-H-L-F2;

(c) F2-L-F1-L-H;

(d) F2-L-H-L-F1;

(e) H-L-F1-L-F2; and

(f) H-L-F2-L-F1;

wherein F1 comprises an amino acid sequence comprising amino acid residues 7–26 of SEQ ID NO: 16, H comprises an amino acid sequence comprising amino acid residues 56–62 of SEQ ID NO: 16, F2 comprises an amino acid sequence comprising amino acid residues 79–87 of SEQ ID NO:16, and L comprises a polypeptide linker, and

wherein the single-chain protein is capable of inducing endochondral bone formation in a mammal.

6,040,432

METAL COMPLEXES, OF DTPA DERIVATIVES SUITABLE FOR USE IN DIAGNOSIS AND THERAPY

Werner Krause; Franz-Karl Maier; Michael Bauer; Gabriele Schuhmann Giampieri; Wolf-Rudiger Press, all of Berlin, Germany, and Peter Muschik, Ladeburg, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Jun. 7, 1995, Appl. No. 488,287

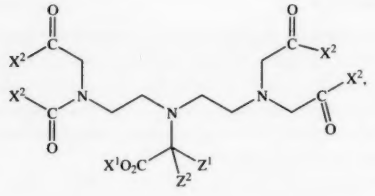
Claims priority, application Germany, Feb. 21, 1995, 195 07 820

Int. Cl.[7] **C07F** *5/00;13/00;* **A61K** *51/04;* **C07C** *229/00*

U.S. Cl. 534—16 **13 Claims**

1. A compound of general formula I

(I)



in which

each X^1 independently of one another, is a hydrogen atom or a metal ion equivalent of an element of atomic numbers 20–32, 39–51 or 57–83,

each X^2 independently of one another, is a group O—X^1 wherein X^1 has the above-identified meaning,

or $N(R^1)R^2$ in which

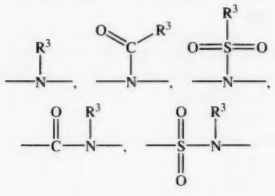
each R^1, R^2 independently of one another, is

a) a hydrogen atom or b) a saturated or unsaturated, branched or straight-chain C_1–C_{20} chain or a cyclic or bicyclic unit formed from a C_1–C_{20} chain or part of a C_1–C_{20} chain, which

(i) is interrupted by zero to three moieties selected from the group consisting of oxygen atoms, sulfur atoms, sulfoxy groups, sulfono groups, and combinations thereof,

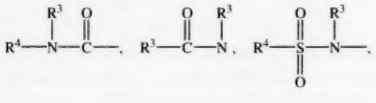
(ii) is substituted by zero to six moieties selected from the group consisting of phenyl, pyridyl, R^3S, R^3OOC, R^3O groups and combinations thereof, and

(iii) further contains zero to three moieties selected from the group consisting of



carbonyl groups, thiocarbonyl groups and combinations thereof,

and the phenyl and pyridyl groups are substituted zero to three times, independently of one another, by moieties selected from the group consisting of R^3O_2C,



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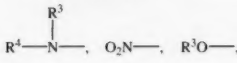


R^4 groups and combinations thereof or $N(R^1)(R^2)$ is a four- to eight-membered ring, which is unsubstituted or substituted by moieties selected from the group consisting of two additional oxygen atoms, two carbonyl groups and combinations thereof, and at least two of the radicals with X^1 have X^1 as a metal ion equivalent of an element of atomic numbers 20–32, 39–51 and 57–83,

Z^1 is a saturated or unsaturated, cyclic or bicyclic unit formed from a C_6–C_{20} chain or part of a C_6–C_{20} chain which is substituted by zero to six moieties selected from the group consisting of phenyl, R^3OOC, R^3O groups and combinations thereof, and the phenyl groups are unsubstituted or substituted singly or repeatedly, independently of one another, by moieties selected from the group consisting of R^3O_2C—, R^3O—, R^4 groups and combinations thereof, or

a saturated or unsaturated branched or straight-chain C_6–C_{20} chain which is substituted by one to six phenyl groups which are unsubstituted or substituted singly or repeatedly, independently of one another, by moieties selected from the group consisting of R^3O_2C—, R^3O—, R^4 groups and combinations thereof,

Z^2 is a) a hydrogen atom or b) a saturated or unsaturated cyclic or bicyclic unit formed by a C_6–C_{20} chain or part of a C_6–C_{20} chain, which is substituted by zero to six moieties selected from the group consisting of phenyl,

R^3OOC, R^3O groups and combinations thereof

and the phenyl groups are substituted zero to three times, independently of one another, by moieties selected from the group consisting of R^3O_2C—, R^3O, R^3 groups and combinations thereof, or

a saturated or unsaturated branched or straight-chain C_6–C_{20} chain which is substituted by one to six phenyl groups which are unsubstituted or substituted singly or repeatedly, independently of one another, by moieties selected from the group consisting of R^3O_2C—, R^3O—, R^4 groups and combinations thereof,

each R^3 independently of one another, is a) a hydrogen atom or b) a phenyl radical or a straight-chain, branched or cyclic C_1–C_6 radical, which

(i) is interrupted by zero to two moieties selected from the group consisting of oxygen atoms, phenylene groups and combinations thereof,

(ii) is substituted with moieties selected from the group consisting of zero to three HO radicals, zero to three HOOC radicals, zero to two phenyl radicals, and combinations thereof,

each R^4 independently of one another, is a phenyl radical or a straight-chain, branched or cyclic C_1–C_6 radical, which is interrupted by zero to two moieties selected from the group consisting of oxygen atoms, phenylene groups and combinations thereof, and is substituted with moieties selected from the group consisting of zero to three HO radicals, zero to three HOOC radicals, zero to two phenyl radicals and combinations thereof,

in which free carboxylic acid groups not used for complexing of the compounds of general formula I according to the invention are optionally present in the form of their salts with physiologically compatible inorganic cations, organic cations, or both.

6,040,433

SULFINYL HEXOSE DERIVATIVES USEFUL FOR GLYCOSYLATION

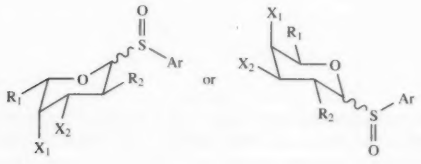
Daniel E. Kahne, Princeton, N.J., and Lin Yan, Cambridge, Mass., assignors to The Trustees of Princeton University, Princeton, N.J.

Provisional application No. 60/013,800, Mar. 21, 1996. This application Mar. 21, 1997, Appl. No. 822,131.

Int. Cl.[7] **C07G** *3/00*

U.S. Cl. 536—4.1 **12 Claims**

1. A hexose of the formula



in which R_1 and R_2 may be the same or different and each represents a substituent comprising one or more of the elements hydrogen, carbon, nitrogen, oxygen, sulfur, or phosphorus; Ar of the —SOAr group represents an aromatic group; and X_1 and X_2 may be the same or different and together with the hexose carbon atoms to which they are attached form a cyclic structure.

6,040,434

ALDEHYDE OXIDASE INHIBITORS FOR TREATMENT OF AIDS

Tadanobu Inaba, 72 Beaconsfield Avenue, Toronto, Ontario, Canada, M6J 3H9; Shirin Fayz, 80 Adelaide Street East, TH #12, Toronto, Ontario, Canada, M5C 1K9, and David John Stewart, Unit 401-3980 Inlet Crescent, North Vancouver, British Columbia, Canada, V7G 29P

Filed Dec. 1, 1997, Appl. No. 984,478

Int. Cl.[7] **A61K** *31/70;9/00;9/22*

U.S. Cl. 536—23 **13 Claims**

1. A method for screening a candidate compound for potential utility for reducing or preventing the formation of 3'-amino-3'-deoxythymidine (AMT) from 3'-amino-3'-deoxythymidine (AZT) in a mammal receiving AZT therapy comprising the steps of

(a) providing a candidate compound; and

(b) determining the effect of the compound on the formation of AMT from AZT by an aldehyde oxidase preparation, an inhibitory effect on the formation of AMT being indicative of said potential utility.

6,040,435

ANTIMICROBIAL CATIONIC PEPTIDES

Robert E. W. Hancock, and Nedra Karunaratne, both of Vancouver, Canada, assignors to University of British Columbia, Vancover, Canada

Continuation-in-part of application No. 08/460,464, Jun. 2, 1995, Pat. No. 5,877,274. This application May 31, 1996, Appl. No. 658,857.

Int. Cl.[7] **C07H** *21/04*

U.S. Cl. 536—23.1 **2 Claims**

1. An isolated polynucleotide which encodes a peptide selected from the group consisting of: (SEQ ID NO:1) NH_2-KWKSFIKKLTTAVKKVLTTGLPALIS-COOH, (SEQ ID NO:2) NH_2-KWKSFIKKLTSAAKKVVTTAKPLISS-COOH, (SEQ ID NO:3) NH_2-KWKSFIKNLTKGGSKILTTGLPALIS-COOH, (SEQ ID NO:4) NH_2-KWKKFIKNLTKGGSKILTTGLPALIS-COOH, (SEQ ID NO:5) NH_2-KWKSFIKNLEKVLKPGGLLSNIVTSL-COOH, (SEQ ID NO:6) NH_2-KWKSFIKNLEKVLKKGPILANLVSIV-COOH, (SEQ ID NO:7) NH_2-KWKEFIKKLTTAVKKVLTTGLPALIS-COOH, (SEQ ID NO:8) NH_2-KWKKFIKELQKVLAPGGLLSNIVTSL-COOH, (SEQ ID NO:9) NH_2-KWKSFIKKLTSVLKKVVTTALPALIS-COOH, (SEQ ID NO:10) NH_2-KWKSFIKNLTKVLKKVVTTALPALIS-COOH, (SEQ ID NO:11) NH_2-KWKLFKKKGTGAVLTVLTTGLPALIS-COOH, (SEQ ID NO:12) NH_2-KWKSFIKKLTSVLKKVVTTAKPLISS-COOH, (SEQ ID NO:13) NH_2-KKKSFIKLLTSAKVSVLTTAKPLISS-COOH, (SEQ ID NO:14) NH_2-KWKKFIKELQKVLKPGGLLSNIVTSL-COOH, (SEQ ID NO:15) NH_2-KKWWRRVLSGLKTGPALSNV-COOH, (SEQ ID NO:16) NH_2-KKWWRRVLKGLSSGPALSNV-COOH, (SEQ ID NO:17) NH_2-KKWWRRALQALKNGPALSNV-COOH, (SEQ ID NO:18) NH_2-KKWWRRVLSGLKTAGPAIQSVLNK-COOH, (SEQ ID NO:19) NH_2-KKWWRRALQGLKTAGPAIQSVLNK-COOH, (SEQ ID NO:20) NH_2-KKWWKAQKAVNSGPNALQTLAQ-COOH, (SEQ ID NO:21) NH_2-KKWWKAKKFANSGPNALQTLAQ-COOH, and (SEQ ID NO:22) NH_2-KKWWKFIKKAVNSGTTGLQTLAS-COOH.

6,040,436

NUCLEIC ACID ENCODING HUMAN NEURONAL CALCIUM CHANNEL SUBUNITS

Rodrigo Franco, Basking Ridge; Ai Ru Sun Chen, Piscataway, and David Joseph Shuey, Plainsboro, all of N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Sep. 16, 1996, Appl. No. 713,118

Int. Cl.[7] **C07H** *21/02*

U.S. Cl. 536—23.1 **12 Claims**

1. An isolated nucleic acid encoding a calcium channel α1B subunit comprising SEQ ID NO. 1.

6,040,437

TYROSINE PHOSPHORYLATED CLEAVAGE FURROW-ASSOCIATED PROTEINS (PSTPIPS)

Laurence A. Lasky, Sausalito, and Donald J. Dowbenko, San Bruno, both of Calif., assignors to Genentech, Inc., So. San Francisco, Calif.

Provisional application No. 60/104,590, Feb. 7, 1997. This application Sep. 29, 1997, Appl. No. 938,830.

Int. Cl.[7] **C07H** *21/02*

U.S. Cl. 536—23.1 **10 Claims**

1. An isolated nucleic acid molecule hybridizing under stringent conditions to the complement of the nucleic acid of SEQ ID NO: 2 and which encodes a polypeptide substantially retaining the ability to bind to a protein tyrosine phosphatase which (a) possesses a non- catalytic domain comprising a region rich in proline, serine and threonine residues and a C-terminal 20 amino acid segment which is rich in proline residues, and (b) defines at least one SH3 binding domain, wherein said stringent conditions are hybridization in a solution containing 50% formamide, 5×SSC (0.75 M NaCl, 0.075 M sodium citrate), 50 mM sodium phosphate (pH

6–8), 0.1% sodium pyrophosphate, 5×Denhardt's solution, 50 μg/ml sonicated salmon sperm DNA, 0.1% sodium dodecyl sulfate (SDS) and 10% dextran sulfate at 42° C., followed by wash at 42° C. in 0.2×SSC and 0.1% SDS.

6,040,438

REAGENT USEFUL FOR SYNTHESIZING SULFURIZED OLIGONUCLEOTIDE ANALOGS

Zacharia S. Cheruvallath, San Diego; Vasulinga T. Ravikumar, Carlsbad; Douglas L. Cole, and Daniel C. Capaldi, both of San Diego, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation of application No. 08/811,233, Mar. 3, 1997, Pat. No. 5,902,881. This application Jun. 25, 1998, Appl. No. 104,330.

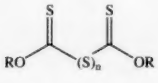
This patent is subject to a terminal disclaimer.

Int. Cl.[7] C07H *21/00*

U.S. Cl. 536—25.3 **18 Claims**

1. A method of synthesizing a sulfurized oligonucleotide analog, comprising:

contacting an oligonucleotide analog comprising at least one phosphorous(III) linkage with a solution comprising a solvent and a thiodicarbonic acid diester polysulfide represented by the formula:



in an automated DNA synthesizer, wherein the solution is in fluid communication with the oligonucleouide analog on the DNA synthesizer, to produce an oligonucleotide analog comprising at least one sulfurized phosphorous(V) linkage, wherein

each R is independently selected from the group consisting of C_1–C_8 alkyl, substituted C_1–C_8 alkyl, C_2–C_8 heterocycloalkyl containing up to three heteroatoms, substituted C_2–C_8 heterocycloalkyl containing up to three heteroatoms, C_6–C_{14} aryl, substituted C_6–C_{14} aryl, C_3–C_{11} hetaryl containing up to three heteroatoms, substituted C_3–C_{11} hetaryl containing up to three heteroatoms, C_7–C_{18} aralkyl, substituted C_7–C_{18} aralkyl, C_4–C_{15} heterocycloaralkyl containing up to three heteroatoms and substituted C_4–C_{15} heterocycloaralkyl containing up to three heteroatoms; and

n is 2, 3 or 4.

6,040,439

METHOD FOR CHEMICAL SYNTHESIS OF OLIGONUCLEOTIDES

Yoshihiro Hayakawa, and Masanori Kataoka, both of Aichi, Japan, assignors to Japan Science and Technology Corporation, Saitama, Japan

Filed Sep. 3, 1998, Appl. No. 145,973

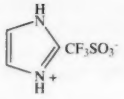
Claims priority, application Japan, Sep. 5, 1997, 241292

Int. Cl.[7] C07H *21/00*

U.S. Cl. 536—25.34 **2 Claims**

1. A method for chemically synthesizing an oligonucleotide by a phosphoramidite method, which comprises:

reacting amino group-unprotected nucleosides individually with a phosphoroamidite reagent in the presence of imidazole trifluoromethanesulfonate represented by the following chemical formula:



to prepare amino group-unprotected nucleoside phosphoroamidites; and

coupling each of the prepared amino group-unprotected nucleoside phosphoroamidites in a predetermined order to chemically synthesize the oligonucleotide of a specific nucleotide sequence.

6,040,440

HYPOPHOSPHITE DEOXYGENATION REACTIONS IN THE SYNTHESIS OF ERYTHROMYCIN DERIVATIVES

Alexandra E. Graham, Mundelein; Albert V. Thomas, Libertyville, and Rachel R. P. Yang, Park City, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

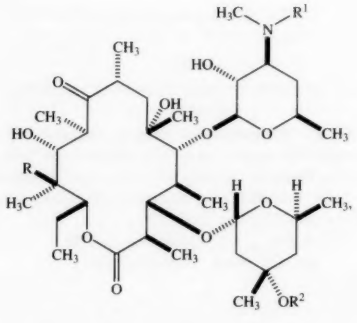
Filed Mar. 6, 1998, Appl. No. 36,186

Int. Cl.[7] C07H *17/08;1/03*

U.S. Cl. 536—124 **21 Claims**

1. A process for preparing a compound having the formula (II):

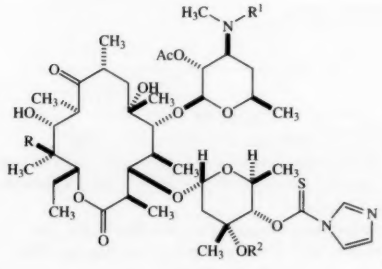
(II)



wherein R is H or OH, R^1 is H or loweralkyl, and R^2 is H or CH_3; comprising the steps of:

(a) reacting a starting material compound having the formula (III):

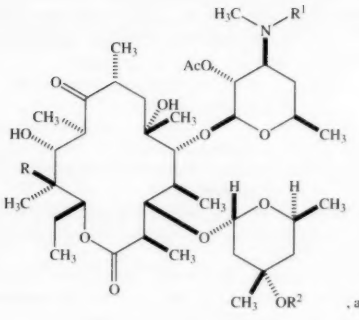
(III)



wherein R, R^1, and R^2 are as defined above;

with an inorganic hypophosphite salt and a free radical initiator in a water-miscible protic solvent, to form a compound having the formula (IV):

(IV)



, and

(b) removing the 2'-acetyl group.

6,040,441

NEMATODE-EXTRACTED SERINE PROTEASE INHIBITORS AND ANTICOAGULANT PROTEINS

George Phillip Vlasuk, Carlsbad, Calif.; Patrick Eric Hugo Stanssens, St-Martens-Latem, Belgium; Joris Hilda Lieven Messens, Dilbeek, Belgium; Marc Josef Lauwereys, Haaltert, Belgium; Yves Rene LaRoche, Brussels, Belgium; Laurent Stephane Jespers, Tervuren, Belgium; Yannick Georges Jozef Gansemans, Ichtegem, Belgium; Matthew Moyle, Boulder, Colo., and Peter W. Bergum, San Diego, Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation of application No. 08/809,455, filed as application No. PCT/US95/13231, Oct. 17, 1995, and a continuation-in-part of application No. 08/486,399, Jun. 5, 1995, Pat. No. 5,866,543, application No. 08/461,965, Jun. 5, 1995, Pat. No. 5,872,098, application No. 08/465,380, Jun. 5, 1995, Pat. No. 5,863,894, and application No. 08/486,397, Jun. 5, 1995, Pat. No. 5,866,542, each which is a continuation-in-part of application No. 08/326,110, Oct. 18, 1994, Pat. No. 5,945,275. This application Feb. 12, 1999, Appl. No. 249,471.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **C07H** *21/04*

U.S. Cl. 536—252 **19 Claims**

1. An isolated recombinant cDNA molecule encoding a protein having serine protease inhibitory activity and having one or more NAP domains, wherein each NAP domain includes the sequence:

Cys-A1-Cys-A2-Cys-A3-Cys-A4-Cys-A5-Cys-A6-Cys-A7-Cys-A8-Cys-A9-Cys-A10 [FORMULA IV],

wherein

(a) A1 is an amino acid sequence of 7 to 8 amino acid residues;

(b) A2 is an amino acid sequence of 3 to 5 amino acid residues;

(c) A3 is an amino acid sequence of 3 amino acid residues;

(d) A4 is an amino acid sequence;

(e) A5 is an amino acid sequence of 3 to 4 amino acid residues;

(f) A6 is an amino acid sequence;

(g) A7 is an amino acid residue;

(h) A8 is an amino acid sequence of 10 to 12 amino acid residues;

(i) A9 is an amino acid sequence of 5 to 7 amino acid residues; and

(j) A10 is an amino acid sequence;

wherein each of A2, A4, A6 and A10 has an independently selected number of independently selected amino acid residues and each sequence is selected such that each NAP domain has in total less than about 120 amino acid residues.

6,040,442

PROCESS FOR PREPARING 1,2,5-THIADIAZOLE CONTAINING ETHERS

Leander Merritt, and John S. Ward, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

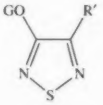
Filed Jun. 1, 1995, Appl. No. 457,082

Int. Cl.[7] **C07D** *401/12;403/12;285/10;487/00*

U.S. Cl. 540—461 **20 Claims**

1. A process for preparing a compound of formula 1

1



wherein

R^1 is hydrogen, halogen, NR^6R^7, R^4, —OR^4, —SR^4, SOR^4, —SO_2R^4, C_{3-10}-cycloalkyl, C_{4-12}-(cycloalkylalkyl), —Z—C_{3-10}-cycloalkyl, —Z—C_{4-12}-(cycloalkylalkyl), —OR^5Y, —SR^5Y, —OR^5ZY, —SR^5ZY, —OR^5ZR^4, —SR^5ZR^4, phenyl or benzyloxycarbonyl, or phenyl or benzyloxycarbonyl substituted with one or more substituents independently selected from halogen, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF_3, or —CF_3;

R^4 is C_{1-15}-alkyl, C_{2-15}-alkenyl, or C_{2-15}-alkynyl, each of which is optionally substituted with one or more substituents independently selected from halo, —CF_3, —CN, Y, phenyl or phenoxy, or phenyl or phenoxy substituted with one or more substituents independently selected from halo, —CN, C_{1-4}-alkyl, C_{1-4}-alkoxy, —OCF_3, or —CF_3;

Z is oxygen or sulphur;

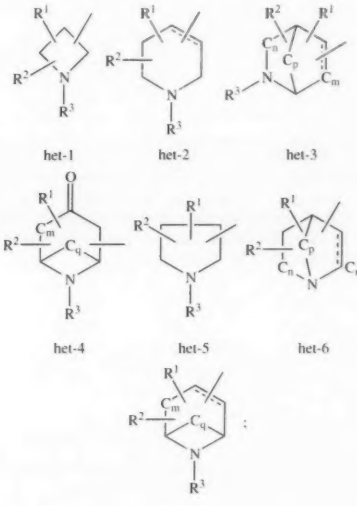
R^5 is C_{1-15}-alkylene, C_{2-15}-alkenylene, or C_{2-15}-alkynylene;

Y is a 5 or 6 membered heterocyclic group;

R^6 and R^7 independently are C_{1-6}-alkyl; or

R^6 and R^7 together with the nitrogen atom from a 4- to 6-membered ring;

G is an azacyclic or azabicyclic ring system selected from:



het-1 het-2 het-3

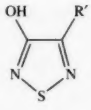
het-4 het-5 het-6

het-7

R^1 and R^2, independently, are hydrogen, C_{1-15}-alkyl, C_{2-5}-alkenyl, C_{2-5}-alkynyl, C_{1-10}-alkoxy, or C_{1-5}-alkyl substituted with one or more substituents independently selected from —COR^6, halo or phenyl;

$R^{6'}$ is hydrogen or C_1–C_3 alkyl;
R^3 is C_{1-5}-alkyl, C_{2-5}-alkenyl or C_{2-5}-alkynyl;
m, n, p and p, independently, are 0, 1 or 2;
q is 1 or 2; and
- - - is a single or double bond;
comprising contacting a compound of formula 2

2



wherein R' is as defined supra; with a compound of the formula G—OH, a phosphorous(III) compound, and a diester of azodicarboxylate.

6,040,443

PROCESS FOR THE PRODUCTION OF BENZOXAZINONES

Georges Metzger, Moernach, France; Dieter Reinehr, Kandern, Germany, and Serge Hauger, Ransbach-le-Bas, France, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Jul. 20, 1998, Appl. No. 119,300

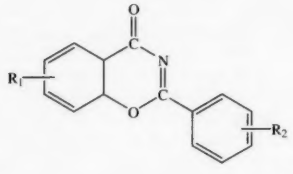
Claims priority, application United Kingdom, Jul. 22, 1997, 9715312

Int. Cl.[7] C07D *265/02*

U.S. Cl. 544—90 **10 Claims**

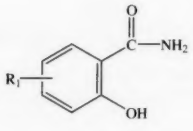
1. A process for the production of a 1,3-benzoxazin-4-one having the formula.

(1)



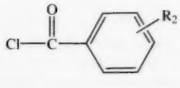
in which R_1 and R_2, independently, are hydrogen, cyano, halogen, nitro, C_1–C_{20}alkyl, O—C_1–C_{20}alkyl, phenyl, NH—CO—C_1–C_{20}alkyl, $N(R_3)_2$, $SO_2N(R_3)_2$, $COOR_3$ or $CON(R_3)_2$ in which R_3 is hydrogen, cyano, halogen, nitro, C_1–C_{20}alkyl, O—C_1–C_{20}alkyl, phenyl or NH—CO—C_1–C_{20}alkyl, comprising reacting, at elevated temperature, 1 molar equivalent of an o-hydroxybenzamide of the formula:

(2)



in which R_1 has its previous significance, with 2 to 6 molar equivalents of a benzoyl chloride of the formula:

(3)



in which R_2 has its previous significance, in which the process is conducted by heating the reaction mixture, in the absence of any external solvent, until a melt is formed, using a molar ratio of the reactant of formula (3) to the reactant of formula (2) ranging from 2.01:1 to 4:1.

6,040,444

PROCESS FOR PREPARING FURAN NITRONE COMPOUNDS

Allan L. Wilcox, Mountain View, and Yong-Kang Zhang, Santa Clara, both of Calif., assignors to Centaur Pharmaceuticals, Inc., Sunnyvale, Calif.

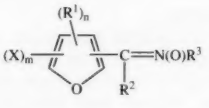
Division of application No. 08/895,968, Jul. 17, 1997, Provisional application No. 60/022,169, Jul. 19, 1996. This application May 24, 1999, Appl. No. 317,267.

Int. Cl.[7] C07D *307/52;405/12;413/12*

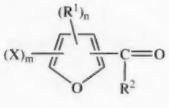
U.S. Cl. 544—152 **16 Claims**

1. A process for preparing a compound of formula I:

I



wherein
each R^1 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, aryl, alkoxy, alkcycloalkyl, cycloalkyl, cycloalkenyl and halo;
R^2 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, aryl, alkcycloalkyl, cycloalkyl and cycloalkenyl;
R^3 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, alkcycloalkyl, cycloalkyl and cycloalkenyl;
each X is independently selected from the group consisting of $—SO_3Y$, $—S(O)R^4$, $—SO_2R^5$ and $—SO_2NR^6R^7$;
wherein Y is hydrogen or a pharmaceutically acceptable cation;
R^4 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, aryl, alkcycloalkyl, cycloalkyl and cycloalkenyl;
R^5 is selected from the group consisting of alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, aryl, alkcycloalkyl, cycloalkyl and cycloalkenyl;
R^6 and R^7 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, alkynyl, alkaryl, aryl, alkcycloalkyl, cycloalkyl and cycloalkenyl; or R^6 and R^7 together with the nitrogen atom to which they are attached can form a heterocyclic ring containing from 2 to 8 carbon atoms and optionally from 1 to 3 additional heteroatoms selected from the group consisting of oxygen, nitrogen and sulfur;
m is an integer from 1 to 3; and n is an integer from 0 to 2, provided that m+n= 3, said process comprising reacting a furan carbonyl compound of the formula:



with a hydroxylamine of formula V:

$HO—NH—R^3$ V

to provide a compound of formula I.

6,040,445

ACYCLOVIR DIHYDRATE SODIUM SALT AND THE PREPARATION THEREOF

Giuseppe Guazzi, Cassino D'Alberi Mulazzano, Italy, assignor to Solchem Italiana S.p.A., Assago, Italy

Filed Oct. 27, 1997, Appl. No. 957,847

Claims priority, application Italy, Feb. 21, 1997, MI97A0383

Int. Cl.[7] C07D *473/18*

U.S. Cl. 544—276 **2 Claims**

1. A process for the preparation of the dihydrate sodium salt of Acyclovir which comprises dissolving Acyclovir and sodium hydroxide in a solvent selected from water or a mixture of water with isopropanol, ethanol, methanol, acetone, dimethylformamide or dimethylacetamide, and precipitating the resulting dihydrate sodium salt in a solvent selected from isopropanol, ethanol, methanol, acetone, dimethylformamide and dimethylacetamide.

6,040,446

PROCESS FOR PREPARING A 2-(2-AMINO-1,6-DIHYDRO-6-OXO-PURIN-9-YL) METHOXY-1,3-PROPANEDIOL DERIVATIVE

Charles A. Dvorak; Douglas L. Wren, both of Palo Alto; Lawrence E. Fisher, Mountain View; Steven D. Axt, San Jose; Eric R. Humphreys, San Bruno; Humberto B. Arzeno, Cupertino; Colin C. Beard, Palo Alto, all of Calif.; Sam Linh Nguyen, Denver, Colo.; Yeun-Kwei Han, Louisville, Colo.; Christopher R. Roberts, Berthoud, Colo.; Jan P. Lund, Boulder, Colo., and Paul R. Fatheree, San Francisco, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

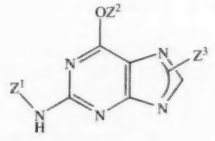
Continuation-in-part of application No. 08/779,540, Jan. 8, 1997, abandoned, which is a continuation-in-part of application No. 08/592,079, Jan. 26, 1996, abandoned. This application Jul. 31, 1998, Appl. No. 127,380.

Int. Cl.[7] C07D *473/18*

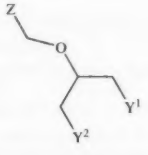
U.S. Cl. 544—276 **17 Claims**

1. A process for preparing the compound 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate or a pharmaceutically acceptable salt or diastereomers thereof, comprising:

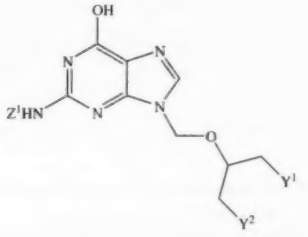
(a) condensing a guanine derivative of Formula (II)



wherein the solid curved line between the two nitrogens of the imidazole ring together with Z^3 indicate a mixture of N-7 and N-9 isomers, Z^1, Z^2, and Z^3 are independently hydrogen or a silyl group of the formula $—SiR^5R^6R^7$, provided that at least one of Z^1, Z^2 and Z^3 must be a silyl group, in which R^5, R^6, and R^7 are independently lower alkyl, or optionally, Z^1 may be an amino-protecting group selected from the group consisting of acyl of the formula R—C(O)—, wherein R is alkyl of 1–6 carbon atoms; trityl, optionally substituted with methoxy, and N-(9-fluorenylmethoxycarbonyl, with a glycerol derivative of Formula (III)

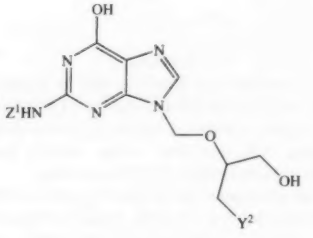


wherein Y^1 and Y^2 independently are aralkyloxy, or one of Y^1 and Y^2 is halo or acyloxy, wherein acyl is as defined above, and the other is aralkyloxy, and Z is a leaving group selected from acyloxy as defined above, benzoyloxy, halo, mesyloxy or tosyloxy, optionally in the presence of a catalyst, to produce a compound of Formula (IV)



wherein Z^1 is hydrogen or an amino-protecting group as defined above, and Y^1 and Y^2 are as defined above;

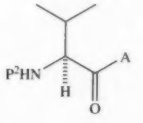
(b) deprotecting the compound of Formula (IV) by basic hydrolysis when one of Y^1 and Y^2 is halo or acyloxy as defined above, and the other is aralkyloxy, or by hydrogenolysis when both Y^1 and Y^2 are aralkyloxy, to a compound of Formula (V)

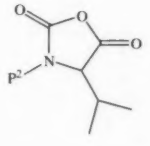


wherein Z^1 is as defined above, and Y^2 is aralkyloxy;

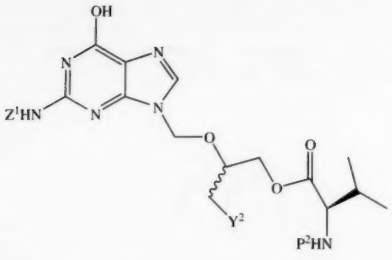
(c) optionally converting the compound of Formula (V) into an acid addition salt;

(d) esterifying the compound of Formula (V) with an activated protected derivative of L-valine of Formulae (VI) or (VIa)





wherein A is a carboxy-activating group, and P^2 is an amino-protecting group, to produce a monovalinate of Formula (VII)



wherein Z^1 is as defined above, P^2 is an amino-protecting group and Y^2 is aralkyloxy; and

(e) deprotecting the compound of Formula (VII) to 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate or a pharmaceutically acceptable salt thereof; optionally followed by

(f) converting 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate into a pharmaceutically acceptable salt thereof; or

(g) separating the 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-propyl-L-valinate into its (R) and (S) diastereomers.

6,040,447

PURINE COMPOUNDS HAVING PDE IV INHIBITORY ACTIVITY AND METHODS OF SYNTHESIS

David J. Cavalla, Cambridge, United Kingdom; Mark Chasin, Manalapan, N.J., and Peter Hofer, Liestal, Switzerland, assignors to Euro-Celtique S.A., Luxembourg

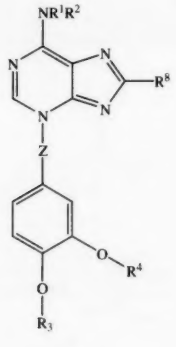
Provisional application No. 60/069,371, Dec. 12, 1997. This application Dec. 10, 1998, Appl. No. 209,922.

Int. Cl.[7] **C07D** *473/34;239/48;239/42*

U.S. Cl. 544—277 **12 Claims**

1. A method of forming a compound having the formula (I):

(I)



wherein:

Z is selected from the group consisting of CH_2, CH_2CH_2, $CH(CH_3)$, CH=CH, C≡C, NH, $N(C_1–C_3$ alkyl), O, S, $C(O)CH_2$ and OCH_2;

R^1 and R^2 are independently selected from the group consisting of hydrogen and a $C_1–C_8$ straight or branched alkyl or a $C_3–C_8$ cycloalkyl;

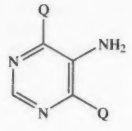
R^3 is a $C_1–C_{12}$ straight or branched alkyl;

R^4 is a $C_3–C_{10}$ cycloalkyl optionally substituted with OH, or a $C_3–C_{10}$ cycloalkenyl optionally substituted with OH; and

R^8 is a $C_1–C_8$ straight or branched alkyl or a $C_3–C_8$ cycloalkyl, optionally substituted with OH; said method comprising the steps of

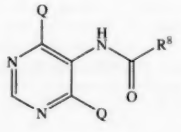
(a) reacting a compound of the formula (II)

(II)



wherein Q is a halogen, with an effective amount of a compound selected from the group consisting of an acid anhydride having an $R^8C(O)$ moiety or an acid halide having an $R^8C(O)$ moiety; to form a compound of the formula (III)

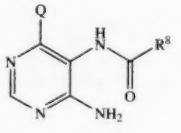
(III)



wherein Q and R^8 are as defined above;

(b) transforming the 6-halo group of said compound (III) to an amine by displacement with ammonia to form compound (IV)

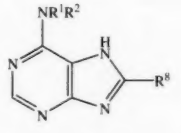
(IV)



wherein Q and R^8 are as defined above;

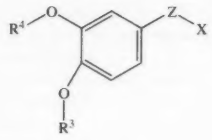
(c) reacting said compound (IV) with a base to cause cyclization to a 6-halo intermediate, said 6-halo group is then transformed to an amine by displacement with an amine group of the formula NR_1R_2, wherein R_1R_2 are as defined above, to form compound (V)

(V)



wherein R^1, R^2 and R^8 are as defined above;

(d) reacting said compound (V) with an effective amount of compound (VI)



(VI)

where R^3 and R^4 are as defined above and X is a halogen; to form the compound of formula (I).

6,040,448

CERTAIN 1-(2-NAPHTHYL) AND 1-(2-AZANAPHTHYL)-4-(1-PHENYLMETHYL) PIPERAZINES, DOPAMINE RECEPTOR SUBTYPE SPECIFIC LIGANDS

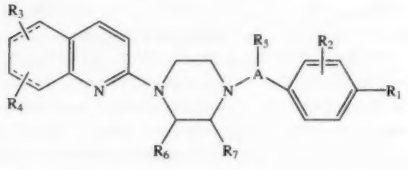
William Greenlee, Teaneck; Ashit Gangly, U. Montclair, both of N.J., and Jan W. F. Wasley, Guilford, Conn., assignors to Neurogen Corporation, Branford, Conn.

Provisional application No. 60/063,149, Oct. 24, 1997. This application Oct. 23, 1998, Appl. No. 177,956.

Int. Cl.[7] **C07D** *403/04*

U.S. Cl. 544—363 **23 Claims**

1. A compound of the formula:



or the pharmaceutically acceptable addition salts thereof, wherein:

R_1 and R_2 independently represent hydrogen, fluoro, chloro, bromo, C_2–C_6 alkyl, trifluoromethyl, trifluoromethoxy or SO_2NH_2, provided that at least one of R_1 and R_2 is not hydrogen;

R_3 and R_4 are the same or different and represent hydrogen, halogen, C_1–C_6 alkyl, C_1–C_4 alkoxy, alkylthio, hydroxy, amino, mono or dialkyl amino where each alkyl is C_1–C_6 alkyl, cyano or trifluoromethyl; and

R_5, R_6, and R_7 are the same or different and represent hydrogen or C_1–C_6 alkyl.

6,040,449

FLUORINE-CONTAINING 1, 4-DISUBSTITUTED PIPERIDINE DERIVATIVES

Yoshimi Tsuchiya, Tsukuba; Takashi Nomoto, Menuma-machi; Hirokazu Ohsawa, Tsukuba; Kumiko Kawakami, Tsukuba; Kenji Ohwaki, Tsukuba, and Masaru Nishikibe, Tsukuba, all of Japan, assignors to Banyu Pharmaceutical Co Ltd, Tokyo, Japan

Division of application No. 08/903,768, Jul. 31, 1997, Pat. No. 5,948,792. This application Apr. 13, 1999, Appl. No. 290,607.

Claims priority, application Japan, Aug. 1, 1996, 8-219436; Feb. 21, 1997, 9-53979

Int. Cl.[7] **C07D** *401/06*

U.S. Cl. 546—193 **2 Claims**

1. 4-Amino-1-(6-aminopyridin-2-ylmethyl) piperidine or a salt thereof.

6,040,450

PROCESS FOR MAKING DIARYL PYRIDINES USEFUL AS COX-2-INHIBITORS

Ian W. Davies, Princeton; Michel Journet, Somerset; Linda Gerena, Piscataway; Robert D. Larsen, Bridgewater; Philip J. Pye, Guttenberg, and Kai Rossen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

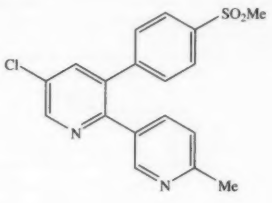
Provisional application No. 60/060,680, Sep. 25, 1997. This application Sep. 15, 1998, Appl. No. 153,405.

Int. Cl.[7] **C07D** *401/04*

U.S. Cl. 546—256 **19 Claims**

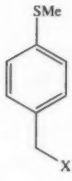
16. A process for making a compound of formula II

II



comprising reacting a compound of formula 12

12

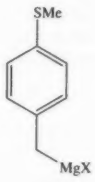


wherein

X is a halogen belonging to the group consisting of iodide, chloride, bromide and fluoride;

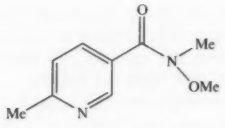
with magnesium in the presence of a solvent/co-solvent mixture to yield a compound of formula 13

13



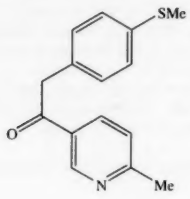
reacting the compound of formula 13 with a compound of formula 9a

9a



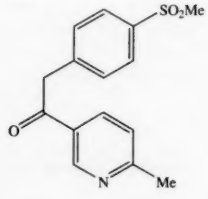
to yield a compound of formula 15a

15a



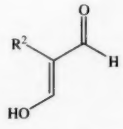
and oxidizing the compound of formula 15a using an oxidizing agent and optionally a catalyst under acid conditions to yield a compound of formula

5a

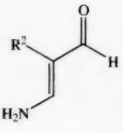


condensing a compound of formula A1 or A2

A1



A2



wherein

R^2 is F, Cl, Br, I, CN, or azide;

under acidic conditions, and optionally in the presence of a non-reactive solvent and in the presence of an ammonium reagent, with compound 5a to yield a compound of Formula II.

6,040,451

SUBSTITUTED INDOLES AND USES THEREOF

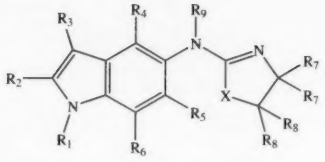
Yoon T. Jeon, Ridgewood, and Charles Gluchowski, Wayne, both of N.J., assignors to Synaptic Pharmaceutical Corporation, Paramus, N.J.

Continuation of application No. 08/926,316, Sep. 5, 1997, Pat. No. 5,948,804, which is a division of application No. 08/608,598, Feb. 29, 1996, Pat. No. 5,677,321. This application Jun. 30, 1999, Appl. No. 345,470.

Int. Cl.[7] **C07D** *417/00;403/02;* **A61K** *31/425;31/415*

U.S. Cl. 548—181 **22 Claims**

1. A compound having the structure:



wherein each of R_1, R_2 and R_3 is independently —H; straight chained or branched C_1–C_7 alkyl, monofluoroalkyl or polyfluoroalkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl;

wherein each of R_4, R_5 and R_6 is independently —H, —F, —Cl, —Br, —I, —OH, —OR_7, —$OCOR_7$, —SR_7, —$N(R_7)_2$, —CN, —CO_2R_7, —$CON(R_7)2$, or —COR_7; straight chained or branched C_1–C_7 alkyl, monofluoroalkyl or polyfluoroalkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl; C_3–C_7 cycloalkyl or cycloalkenyl; C_4–C_7 heterocycloalkyl or heteroaryl; phenyl, substituted phenyl or phenyl substituted C_1–C_4 alkyl wherein the substituted phenyl or phenyl substituted C_1–C_4 alkyl is substituted with —H, —F, —Cl, —Br, —I, —NO_2, —CN, straight chained or branched C_1–C_7 alkyl, straight chained or branched C_2–C_7 alkenyl or alkynyl, —NR_{10}, —OR_{10}, —COR_{10}, —CO_2R_{10}, or —$CON(R_{10})_2$;

wherein each R_7 is independently —H; —$N(R_{10})_2$, —$NR_{10}COR_{10}$, —$(CH_2)_nOR_{10}$, —SO_nR_{10}, —$SO_nN(R_{10})_2$, —$(CH_2)_nN(R_{10})_2$, or —$(CH_2)_nNR_{10}COR_{10}$; straight chained or branched C_1–C_7 alkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl; phenyl, substituted phenyl or phenyl substituted C_1–C_4 alkyl wherein the substituted phenyl or phenyl substituted C_1–C_4 alkyl is substituted with —H, —F, —Cl, —Br, —I, —NO_2, —CN, straight chained or branched C_1–C_7 alkyl, straight chained or branched C_2–C_7 alkenyl or alkynyl, —NR_{10}, —OR_{10}, —COR^{10}, —CO_2R_{10}, or —$CON(R_{10})_2$;

wherein each n is independently an integer from 1 to 4;

wherein each R_8 is independently —H; straight chained or branched C_1–C_7 alkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl; C_3–C_7 cycloalkyl or cycloalkenyl; phenyl, substituted phenyl or phenyl substituted C_1–C_4 alkyl wherein the substituted phenyl or phenyl substituted C_1–C_4 alkyl is substituted with —H, —F, —Cl, —Br, —I, —NO_2, —CN, straight chained or branched C_1–C_7 alkyl, straight chained or branched C_2–C_7 alkenyl or alkynyl, —NR_{10}, —OR_{10}, —COR_{10}, —CO_2R_{10}, or —$CON(R_{10})_2$;

wherein R_9 is independently —H; straight chained or branched C_1–C_7 alkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl; C_3–C_7 cycloalkyl or cycloalkenyl; C_4–C_7 heterocycloalkyl or heteroaryl; phenyl, substituted phenyl or phenyl substituted C_1–C_4 alkyl wherein the substituted phenyl or phenyl substituted C_1–C_4 alkyl is substituted with —H, —F, —Cl, —Br, —I, —NO_2, —CN, straight chained or branched C_1–C_7 alkyl, straight chained or branched C_2–C_7 alkenyl or alkynyl, —NR_{10}, —OR_{10}, —COR_{10}, —CO_2R_{10}, or —$CON(R_{10})_2$;

wherein each R_{10} is independently —H; straight chained or branched C_1–C_7 alkyl; straight chained or branched C_2–C_7 alkenyl or alkynyl; and

wherein X is independently CH_2, O, NH or S; or

a pharmaceutically acceptable salt thereof.

6,040,452

PROCESS FOR MAKING BENZISOTHIAZOLIN-3-ONES

Brian Geoffrey Cox, Huddersfield, and Thomas Gray, Haslemere, both of United Kingdom, assignors to Zeneca Limited, London, United Kingdom

PCT No. PCT/GB97/03130, § 371 Date Jun. 18, 1999, § 102(e) Date Jun. 18, 1999, PCT Pub. No. WO98/28283, PCT Pub. Date Jul. 2, 1998

PCT Filed Nov. 13, 1997, Appl. No. 331,241

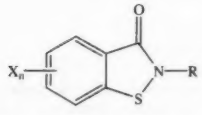
Claims priority, application United Kingdom, Dec. 20, 1996, 9626570

Int. Cl.[7] **C07D** *275/04*

U.S. Cl. 548—209 **12 Claims**

1. A process for making a 1,2-benzisothiazolin-3-one of formula I

(1)



or salts thereof

wherein

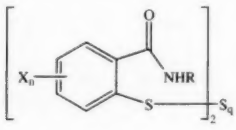
R is hydrogen, aryl, aralkyl, cycloalkyl or C_{1-20}-alkyl;

is halogen, nitro, cyano or C_{1-6}-alkoxy;

n is 0 to 4;

which comprises reacting a bisamide of formula 2

(2)



wherein

q is 0–3

with oxygen or an oxygen-release compound under alkaline conditions in the presence of a nitrogen, sulphur or phosphorus nucleophile substantially inert to 1,2-benzisothiazolinone.

6,040,453

METHOD FOR PREPARING 5,5'-BI-1H-TETRAZOLE SALT

Shunji Hyoda; Masaharu Kita; Hirotoshi Sawada; Shuichi Nemugaki, all of Sakaide; Sumio Otsuka, Takamatsu; Yoshitaka Miyawaki, Takamatsu; Takashi Ogawa, Takamatsu, and Yuhki Kubo, Takamatsu, all of Japan, assignors to Japan Hydrazine Co., Inc, and Masuda Chemical Industry Co., Ltd., both of Japan

Filed Aug. 16, 1999, Appl. No. 374,950

Int. Cl.[7] **C07D** *257/04;403/04*

U.S. Cl. 548—250 **4 Claims**

1. A process for the preparation of a 5,5'-bi-1H-tetrazole diammonium salt by reacting dicyan, sodium azide and ammonium chloride in an aqueous medium.

6,040,454

PROCESS FOR PREPARATION OF A 1-(TETRAZOLYLBIPHENYLMETHYL)-IMIDAZOLE DERIVATIVE

Kiyoto Koguro; Toshikazu Oga; Norihito Tokunaga; Sunao Mitsui, and Ryozo Orita, all of Takasago, Japan, assignors to Toyo Kasei Kogyo Company Limited, Osaka, Japan

Division of application No. 08/805,917, Mar. 4, 1997, Pat. No. 5,744,612. This application Jan. 9, 1998, Appl. No. 4,916.

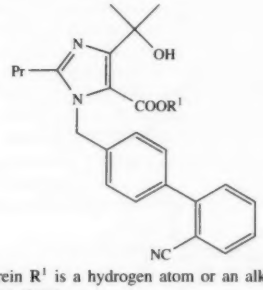
Claims priority, application Japan, Mar. 21, 1996, 8-64900; Sep. 11, 1996, 8-240713

Int. Cl.[7] **C07D** *257/04*

U.S. Cl. 548—253 **5 Claims**

1. A process for preparing a 1- (tetrazolylbiphenylmethyl)imidazole derivative represented by the formula (5), the process comprising the step of reacting a 1-(cyanobiphenylmethyl)imidazole derivative represented by the formula (4) with an inorganic azide salt represented by the formula (2) in an aromatic hydrocarbon solvent in the presence of an amine salt selected from the group consisting of methylamine salt, ethylamine salt, propylamine salt, butylamine salt, amylamine salt, hexylamine salt, cyclohexylamine salt, heptylamine salt, octylamine salt, allylamine salt, benzylamine salt, α-phenylethylamine salt, β-phenylethylamine salt, dimethylamine salt, diethylamine salt, dipropylamine salt, dibutylamine salt, diamylamine salt, dihexylamine salt, dicyclohexylamine salt, diallylamine salt, morpholine salt, piperidine salt, hexamethyleneimine salt, trimethylamine salt, triethylamine salt, tripropylamine salt, tributylamine salt, triamylamine salt, trihexylamine salt, triallylamine salt, pyridine salt, triethanolamine salt, N-methylmorpholine salt, N,N-dimethylcyclohexylamine salt, N,N-dimethylaniline salt, N,N,N',N'-tetramethylethylenediamine salt and 4-dimethylaminopyridine salt, optionally followed by hydrolysis of the obtained compound:

(4)

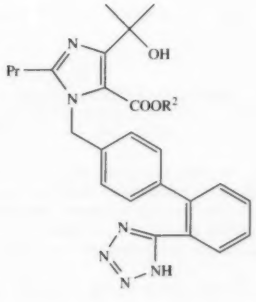


wherein R^1 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms,

$$M(N_3)_n \quad (2)$$

wherein M is an alkali metal or an alkaline earth metal, and n is 1 or 2, and

(5)



wherein R^2 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

6,040,455

ONE-POT PROCESS FOR THE PREPARATION OF 5-SULFONYL-SUBSTITUTED BENZOTRIAZOLES UV ABSORBERS

Mervin G. Wood, Poughquag, N.Y.; William Wiggins, Mobile, Ala.; Catherine Blake, Saraland, Ala.; Albert Carpenter, Mobile, Ala., and Wha Chen, Freemont, Calif., assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

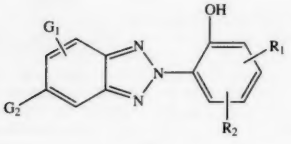
Filed Jan. 21, 1999, Appl. No. 234,879

Int. Cl.[7] **C07D** *249/20*

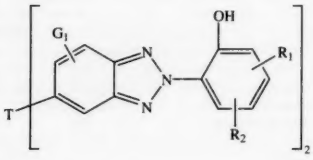
U.S. Cl. 548—259 **18 Claims**

1. A one-pot, two-step process for the preparation of a compound of formula A, B, C or D

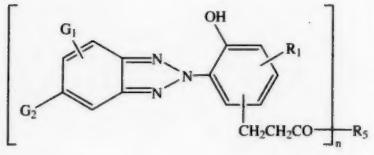
(A)



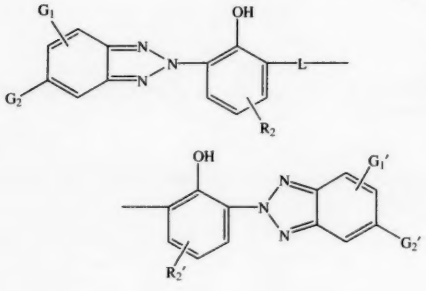
(B)



(C)



(D)



wherein

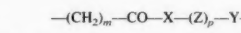
G_1, G_1', G_2 and G_2' are independently hydrogen, halogen, nitro, cyano, R_3SO—, R_3SO_2—, —$COOG_3$, perfluoroalkyl of 1 to 12 carbon atoms, —CO—G_3, —CO—NH—G_3 or —CO—$N(G_3)_2$,

G_3 is hydrogen, straight or branched chain alkyl of 1 to 24 carbon atoms, straight of branched chain alkenyl of 2 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, phenyl, or said phenyl or said phenylalkyl substituted on the phenyl ring by 1 to 4 alkyl of 1 to 4 carbon atoms,

with the proviso that at least one of G_1, G_1', G_2 and G_2' is R_3SO_2,

R_1 is hydrogen, straight or branched chain alkyl of 1 to 24 carbon atoms, straight of branched chain alkenyl of 2 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, phenyl, or said phenyl or said phenylalkyl substituted on the phenyl ring by 1 to 4 alkyl of 1 to 4 carbon atoms,

R_2 and R_2' are independently straight or branched alkyl chain of 1 to 24 carbon atoms, straight or branched chain alkenyl of 2 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, phenyl, or said phenyl or said phenylalkyl substituted on the phenyl ring by 1 to 3 alkyl of 1 to 4 carbon atoms; or R_2 is hydroxyl or —OR_4 where R_4 is straight or branched chain alkyl of 1 to 24 carbon atoms; or said alkyl substituted by one or more —OH, —OCO—R_{11}, —OR_4, —NCO, —NH_2 or —$N(R_4)_2$ groups or mixtures thereof; or said alkyl or said alkenyl interrupted by one or more —O—, —NH— or —NR_4— groups or mixtures thereof and which can be unsubstituted or substituted by one or more —OH, —OR_4 or —NH_2 groups or



wherein

X is —O—or —$N(R_{16})$—,

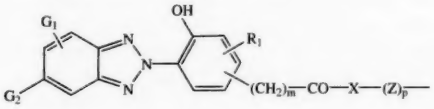
Y is —O—or —$N(R_{17})$—,

Z is C_2–C_{12}-alkylene, C_4–C_{12}-alkylene interrupted by one to three nitrogen atoms, oxygen atoms or a mixture thereof, or is C_3–C_{12}-alkylene, butenylene, butynylene, cyclohexylene or phenylene, each substituted by a hydroxyl group,

m is zero, 1 or 2,

p is 1, or p is also zero when X and Y are —$N(R_{16})$— and —$N(R_{17})$—, respectively,

R_{15} is a group —CO—$C(R_{18})$=C(H)R_{19} or, when Y is —$N(R_{17})$—, forms together with R_{17} a group —CO—CH=CH—CO—, wherein R_{18} is hydrogen or methyl, and R_{19} is hydrogen, methyl or —CO—X—R_{20}, wherein R_{20} is hydrogen, C_1–C_{12}-alkyl or a group of the formula,



wherein the symbols R_1, X, Z, m and p have the meanings defined above, and R_{16} and R_{17} independently of one another are hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkyl interrupted by 1 to 3 oxygen atoms, or is cyclohexyl or C_7–C_{15}aralkyl, and R_{16} together with R_{17} in the case where Z is ethylene, also forms ethylene,

n is 1 or 2,

when n is 1, R_5 is Cl, OR_6 or NR_7R_8, or

R_5 is —$PO(OR_{12})_2$, —$OSi(R_{11})_3$ or —OCO—R_{11}, or straight or branched chain C_1–C_{24}alkyl which is interrupted by —O—, —S— or —NR_{11} and which can be unsubstituted or substituted by —OH or —OCO—R_{11}, C_5–C_{12} cycloalkyl which is unsubstituted or substituted by —OH, straight chain or branched C_2–C_{18}alkenyl which is unsubstituted or substituted by —OH, C_7–C_{15}aralkyl, —CH_2—CHOH—R_{13} or glycidyl,

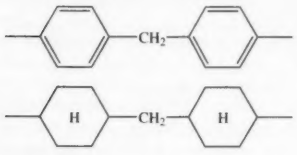
R_6 is hydrogen, straight or branched chain C_1–C_{24}alkyl which is unsubstituted or substituted by one or more OH, OR_4 or NH_2 groups, or —OR_6 is —$(OCH_2CH_2)_wOH$ or —$(OCH_2CH_2)_wOR_{21}$ where w is 1 to 12 and R_{21} is alkyl of 1 to 12 carbon atoms,

R_7 and R_8 are independently hydrogen, alkyl of 1 to 18 carbon atoms, straight or branched chain C_3–C_{18}alkyl which is interrupted by —O—, —S— or —NR_{11}—, C_5–C_{12}cycloalkyl, C_6–C_{14}aryl or C_1–C_3hydroxylalkyl, or R_7 and R_8 together with the N atom are a pyrrolidine, piperidine, piperazine or morpholine ring,

when n is 2, R_5 is one of divalent radicals —O—R_9—O— or —$N(R_{11})$—R_{10}—$N(R_{11})$—,

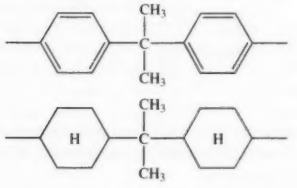
R_9 is C_2–C_8alkylene, C_4–C_8alkenylene, C_4alkynylene, cyclohexylene, straight or branched chain C_4–C_{10}alkylene which is interrupted by —O— or by —CH_2—CHOH—CH_2—O—R_{14}—O—CH_2—CHOH—CH_2—,

R_{10} being straight or branched chain C_2–C_{12}alkylene which may be interrupted by —O—, cyclohexylene, or



or R_{10} and R_{11} with the two nitrogen atoms form a piperazine ring,

R_{14} is straight or branched chain C_2–C_8alkylene, straight or branched chain C_4–C_{10}alkylene which is interrupted by —O—, cycloalkylene, arylene or



where R_7 and R_8 are independently hydrogen, alkyl of 1 to 18 carbon atoms or R_7 and R_8 together are alkylene of 4 to 6 carbon atoms, 3-oxapentamethylene, 3-iminopentamethylene or 3-methyliminopentamethylene,

R_{11} is hydrogen, straight or branched chain C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, straight or branched chain C_3–C_8alkenyl, C_6–C_{14}aryl or C_7–C_{15}aralkyl,

R_{12} is straight or branched chain C_1–C_{18}alkyl, straight or branched chain C_3–C_{18}alkenyl, C_5–C_{10}cycloalkyl, C_6–C_{16}aryl or C_7–C_{15}aralkyl,

R_{13} is H, straight chain or branched C_1–C_{18}alkyl which is substituted by $—PO(OR_{12})_2$, phenyl which is unsubstituted or substituted by OH, C_7–C_{15}aralkyl or $—CH_2OR_{12}$,

L is alkylene of 1 to 12 carbon atoms, alkylidene of 2 to 12 carbon atoms, benzylidene, p-xylylene, α,α,α',α'-tetramethyl-m-xylylene or cycloalkylidene, and

T is —SO—, $—SO_2—$, —SO—E—SO—, —SO—E—SO_2— or $—SO_2—E—SO_2—$,

where E is alkylene of 2 to 12 carbon atoms, cycloalkylene of 5 to 12 carbon atoms, or alkylene interrupted or terminated by cyclohexylene of 8 to 12 carbon atoms,

which comprises

reacting in a first step a compound corresponding to formula A, B, C or D wherein

at least one of G_1, G_1', G_2 or G_2' is halogen,

with an aliphatic, phenylalkyl or aromatic mercaptan of the formula

R_3SH or R_3SM

wherein

R_3 is alkyl of 1 to 20 carbon atoms, $—(CH_2)_xCOOG_3$ where x is 1 to 18, hydroxyalkyl of 2 to 20 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 4 carbon atoms or 1,1,2,2-tetrahydroperfluoroalkyl where the perfluoroalkyl moiety is of 6 to 16 carbon atoms, and

M is an alkali metal or an alkaline earth metal salt of said mercaptan,

in an aprotic solvent at a temperature between 30 and 180° C. in the presence of an alkali metal or alkaline earth metal oxide, carbonate or hydroxide or an aminic compound to form, but not isolate, the compound corresponding to formula A, B, C or D wherein

at least one of G_1,G_1', G_2 or G_2' is $R_3S—$

and, in a second step,

oxidizing said R_3S-substituted compound in an inert solvent at a temperature between 30 and 150° C. using 10% to 70% hydrogen peroxide and a catalyst selected from the oxides of Group VA and VIA metals of the periodic table in the presence of formic acid to give the desired R_3SO_2-substituted compound of formula A, B, C or D.

6,040,456

PROCESS FOR THE PREPARATION OF 4-AMINO-1,2,4-TRIAZOLE

Paul Bourdauducq, Chaponost, France, assignor to Elf Atochem S.A., France

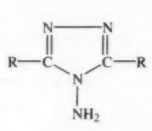
Filed Nov. 6, 1997, Appl. No. 965,144

Claims priority, application France, Nov. 7, 1996, 96 13590

Int. Cl.[7] **C07D** *249/08*

U.S. Cl. 548—265.6 **4 Claims**

1. Process comprising preparation of a product of formula (1):



(1)

in which R denotes H or an alkyl group containing from 1 to 10 carbon atoms, optionally substituted by at least one member select from the group consisting of aryl, hydroxyl and alkenyl, wherein said aryl is a carbocyclic aryl of 6 to 10 carbon atoms, comprising the steps of:

a) reacting hydrazine with a deficiency of carboxylic acid RCOOH, wherein the deficiency of carboxylic acid RCOOH is between 2 to 5% relating to stoichiometry,

b) removing, by distillation, water of reaction,

c) optionally removing water of dilution of the hydrazine and of the acid and

d) crystallizing said product.

6,040,457

PROCESS FOR THE PREPARATION OF FORMYLIMIDAZOLES

Josef Heveling, Naters, and Alain Wellig, Kanton Wallis, both of Switzerland, assignors to Lonza AG, Gampel/Valais, Switzerland

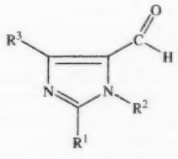
Filed Nov. 16, 1998, Appl. No. 192,372

Claims priority, application Switzerland, Nov. 14, 1997, 2637/97

Int. Cl.[7] **C07D** *233/64*

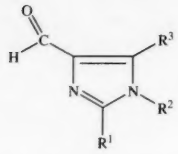
U.S. Cl. 548—333.5 **14 Claims**

1. A process for the preparation of a formylimidazole of the formula:



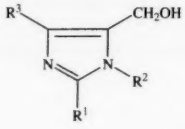
I

or



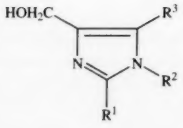
II

in which R^1 is hydrogen or an unsubstituted or substituted alkyl group, R^2 is hydrogen, or an unsubstituted or substituted alkyl, aryl or arylalkyl group, and R^3 is hydrogen or an unsubstituted or substituted alkyl group, comprising catalytically oxidizing a hydroxymethylimidazole of the formula:



III

or



IV

in which R^1, R^2 and R^3 are as defined above, in the presence of a noble-metal catalyst, the catalytic oxidation taking place in the presence of a peroxide.

6,040,458

METHOD FOR PRODUCING N-SUBSTITUTED 3-HYDROXYPYRAZOLES

Uwe Josef Vogelbacher, Ludwigshafen; Michael Keil, Freinsheim; Ralf Klintz, Grünstadt; Josef Wahl, Schifferstadt; Horst Wingert, Mannheim; Hartmann König; Michael Rack, both of Heidelberg; Roland Götz, and Joaquim Henrique Teles, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP97/06780, § 371 Date Jun. 14, 1999, § 102(e) Date Jun. 14, 1999, PCT Pub. No. WO98/27062, PCT Pub. Date Jun. 25, 1998

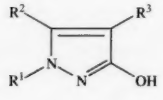
PCT Filed Dec. 4, 1997, Appl. No. 319,880

Claims priority, application Germany, Dec. 17, 1996, 196 52 516

Int. Cl.[7] **C07D** *231/22*

U.S. Cl. 548—371.1 **14 Claims**

1. A process for preparing N-substituted 3-hydroxypyrazoles of the formula I



I

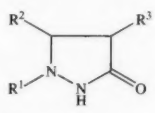
where

R^1 is unsubstituted or substituted C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_{10}-cycloalkyl, unsubstituted or substituted aryl selected from phenyl and naphthyl; heteroaryl selected from furyl, thienyl, pyrrolyl, isoxazolyl, isothiazolyl, pyrazolyl, oxazolyl, imidazolyl, pyridyl, pyridazinyl, pyrimidinyl and triazinyl; and

R^2, R^3 are hydrogen, cyano, halogen and unsubstituted or substituted C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_{10}-cycloalkyl; unsubstituted or substituted aryl selected from phenyl and naphthyl; heteroaryl selected from furyl, thienyl, pyrrolyl, isoxazolyl, isothiazolyl, pyrazolyl, oxazolyl, imidazolyl, pyridyl, pyridazinyl, pyrimidinyl and triazinyl;

where the substituents R^1, R^2 and R^3 are inert under the reaction conditions,

by oxidizing a pyrazolidin-3-one of the formula II



II

which comprises carrying out the reaction of the water-soluble compounds of the formula II in water in the presence of a base using oxygen as oxidizing agent.

6,040,459

N-AMINOALKYLDIBENZOTHIOPHENECARBOXAMIDES; NEW DOPAMINE RECEPTOR SUBTYPE SPECIFIC LIGANDS

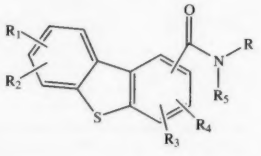
Jun Yuan, Clinton, and Xi Chen, New Haven, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Continuation of application No. 09/088,331, Jun. 1, 1998, Pat. No. 5,929,246, which is a continuation of application No. 08/619,429, Mar. 21, 1996, Pat. No. 5,763,609. This application Aug. 5, 1999, Appl. No. 368,542.

Int. Cl.[7] **C07D** *333/76*

U.S. Cl. 549—43 **1 Claim**

1. A compound of the formula:



or the pharmaceutically acceptable acid addition salts thereof, wherein:

R_1, R_2, R_3, R_4 are the same or different and represent hydrogen, C_1–C_6 alkyl, halogen, hydroxy, amino, cyano, nitro, trifluoromethyl, trifluoromethoxy, C_1–C_6 alkoxy, —O_2CR', —NHCOR', —COR', —SO_mR', where R' is C_1–C_6 alkyl and wherein m is 0, 1 or 2; or

R_1, R_2, R_3, R_4 independently represent —CONR'R", or —NR'R" where R' and R" independently are hydrogen or C_1–C_6 alkyl;

R_5 is hydrogen or C_1–C_6 alkyl; and

R represents an aminoalkyl group.

6,040,460

HIGH PRODUCTIVITY PROCESS TO PRODUCE MALEIC ANHYDRIDE FROM N-BUTANE

Aldo Bertola, Milan, and Salvatore Cassarino, Rome, both of Italy, assignors to Pantochim S.A., Feluy, Belgium

Filed Jun. 22, 1999, Appl. No. 337,542

Claims priority, application Belgium, Jun. 23, 1998, 09800475

Int. Cl.[7] **C07D** *307/36*

U.S. Cl. 549—262 **32 Claims**

1. A process for the production of maleic anhydride by the oxidation of n-butane with molecular oxygen or a molecular oxygen containing gas in the vapor phase at a temperature of about 300° C. to 550° C. in the presence of a suitable phosphorous-vanadium mixed oxide catalyst, with or without modifying components, comprising the steps of:

a) Preparing a reaction mixture comprising oxygen, butane, carbon dioxide and a recycle gaseous stream, wherein the oxygen concentration in the reaction mixture ranges from 5 to 16% by volume, the butane concentration in the reaction mixture ranges from 2 to 20% by volume, the carbon dioxide concentration in the reaction mixture does not exceed 60% by volume and is in a molar ratio to carbon monoxide of at least 1.5 to 1.0,

b) Feeding the reaction mixture to an inlet of an oxidation reactor operating at an inlet pressure in the range of 2.03 to 6.03 bar where a suitable V.P.O. catalyst causes a portion of the butane to react to produce maleic anhydride,

c) Cooling the reaction gases comprising oxygen, non-converted butane, organic by-products, carbon dioxide, carbon monoxide, water steam and maleic anhydride produced,

d) Recovering the maleic anhydride by absorption in a solvent in a maleic anhydride absorber, operating the absorption at an outlet pressure ranging from 1.21 to 4.5 bar, to form a stream comprising recovered maleic anhydride and a stream comprising recycling exhaust gases,

e) Water scrubbing the recycling exhaust gases after removal of maleic anhydride, so as to eliminate all organics present, except butane,

f) Compressing the recycling exhaust gases after the water scrubbing to the pressure of reaction,

g) Separating the compressed recycling exhaust gases to form a first fraction and a second fraction, purging said first fraction of the compressed recycling exhaust gases to avoid accumulation of inerts and of carbon oxides, said recycle gaseous stream comprising said second fraction, and optionally

h) Washing said purge of the compressed recycling exhaust gases with the solvent referred to at step d), to remove by absorption a large fraction of the butane contained in said purge gas stream, the absorbed butane being then desorbed in the maleic anhydride absorber and recovered in the recycling exhaust gases after the removal of maleic anhydride in the maleic anhydride absorber.

6,040,461

SYNTHESIS OF 3-EPI VITAMIN D_3 METABOLITES AND ANALOGS

Andrew David Batcho, North Caldwell; Percy Sarwood Manchand, Montclair, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J., and Syntex (U.S.A.), Palo Alto, Calif.

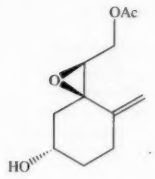
Provisional application No. 60/085,521, May 14, 1998. This application May 11, 1999, Appl. No. 310,084.

Int. Cl.[7] **C07D** *303/04;* **C07F** *9/28*

U.S. Cl. 549—332 **3 Claims**

1.

V



6,040,462

CALIX[4]ARENE DIBENZO CROWN ETHERS, THEIR PREPARATION PROCESS AND THEIR USE FOR THE SELECTIVE EXTRACTION OF CESIUM ION

Won Zin Oh; Kune Woo Lee; Wang Kyu Choi; Hyun Soo Park, all of Taejon-si; Jong Seung Kim, Choongcheongnam-do; Moon Hwan Cho, Kangwon-do, and Jong Kook Kim, Chooncheongnam-do, all of Rep. of Korea, assignors to Korea Atomic Energy Research Institute, Taejon-si, and Korea Electric Power Corporation, Seoul, both of Rep. of Korea

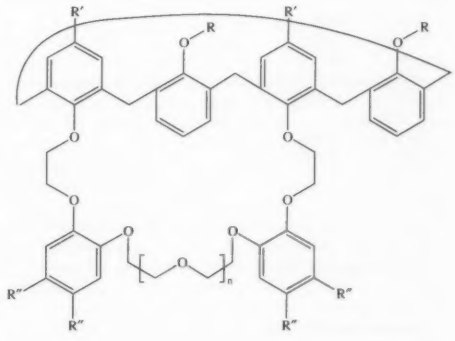
Filed Nov. 23, 1998, Appl. No. 197,920

Claims priority, application Rep. of Korea, Sep. 28, 1998, 98-40327

Int. Cl.[7] **C07D** *323/00;* **C07C** *43/205*

U.S. Cl. 549—352 **4 Claims**

1. A calix[4]arene dibenzo crown ether capable of selectively extracting cesium ions, represented by the following structural formula I:



wherein R is a C_1–C_{10} normal alkyl, a phenyl or a methoxyphenyl, R' is hydrogen, p-tert-butyl or a C_1–C_{10} normal alkyl, R'' is hydrogen or a C_1–C_{10} normal alkyl, and n is 0.

6,040,463

SORDARIN DERIVATIVES

James M. Balkovec, North Plainfield, and Bruno Tse, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

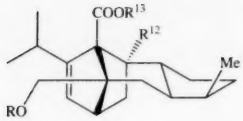
Provisional application No. 60/026,993, Oct. 7, 1996. This application Sep. 24, 1997, Appl. No. 936,462.

Int. Cl.[7] **C07D** *315/00;* **C07C** *229/00*

U.S. Cl. 549—418 **15 Claims**

1. A compound having the formula I:

I



wherein

R is

(a) $C(=O)OR^1$,

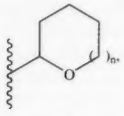
(b) $C(=O)NR^2R^3$,

(c) $C(=O)R^4$,

(d) $CH(R^2)OR^5$,

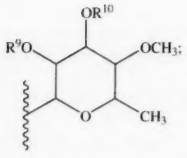
(e) $C(R^6)(R^7)(R^8)$,

(f)



or

(g)



with the proviso that when R^{12} is CHO, R is not (g);

R^1 is

(a) C_1–C_{14} alkyl,

(b) C_2–C_{14} alkenyl,

(c) C_2–C_{14} alkynyl,

(d) C_3–C_{20} cycloalkyl,

(e) C_3–C_{20} cycloalkenyl,

(f) aryl or

(g) aryl C_{1-6} alkyl;

R^2 and R^3 are independently

(a) H or

(b) R^1;

R^4 is

(a) H,

(b) R^1 or

(c) $-(CH_2)_mNR^2R^3$;

R^5 is

(a) R^1 or

(b) $-(CH_2)_xO(CH_2)_yH$;

R^6 is

(a) H,

(b) R^1,

(c) $-(CH_2)_xCHR_{11}(CH_2)_zH$,

(d) $-(CH_2)_xC{\equiv}C(CH_2)_zH$,

(e) $-(CH_2)_xC(R^7){=}CH(CH_2)_zH$,

(f) $-(CH_2)_xC{\equiv}C(CH_2)_mR^{11}$,

(g) $-(CH_2)_xC(R^7){=}CH(CH_2)_mR^{11}$,

R^7 and R^8 are independently

(a) H, or

(b) C_1–C_{14} alkyl;

R^9 and R10 are independently

(a) H,

(a) C_1–C_{14} alkyl,

(a) C_2–C_{14} alkenyl,

(a) aryl C_{1-6} alkyl;

R^{11} is

(a) OR^7,

(b) $OCH_2CH_2(CH_2)_nOR^7$, or

(c) NR^2R^3;

R^{12} is

(a) $-C(=O)R^{14}$,

(b) —CH=NOH, or

(c) $-CH_2OCH_3$;

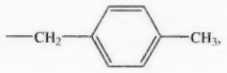
R^{13} is

(a) H,

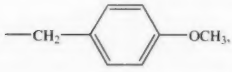
(b) $-CH_2C_6H_5$,

(c) $-CH_2CH{=}CH_2$,

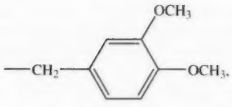
(d)



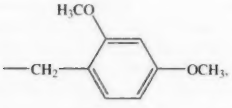
(e)



(f)

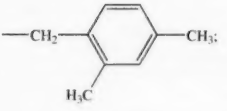


(g)



or

(h)



R^{14} is

(a) H,

(b) C_1–C_4 alkyl,

(c) $-CCl_3$,

(d) $-CBr_3$,

(e) $-CF_3$, or

(f) OH;

n is 0 or 1;

m is 1–6;

x is 2–6;

y is 0–6;

z is 0–6 or

a pharmaceutically or agriculturally acceptable salt thereof.

6,040,464

PROCESS FOR THE PREPARATION OF PROTECTED 3-AMINO-1,2-DIHYDROXYPROPANE ACETAL AND DERIVATIVES THEREOF

Rawle I. Hollingsworth, Haslett, and Guijun Wang, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Provisional application No. 60/087,496, Jun. 1, 1998. This application May 27, 1999, Appl. No. 320,989.

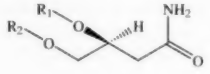
Int. Cl.[7] **C07D** *317/00*

U.S. Cl. 549—451 **19 Claims**

1. A process for preparing a protected 3-amino-1,2-dihydroxypropane acetal in a Hoffman rearrangement reaction

mixture, having the formula:

wherein R_1 and R_2 are protecting groups which can be combined which comprises reacting a protected 1,2-dihydroxybutryamide in a reaction mixture, having the formula:



wherein R_1 and R_2 are the same protecting groups with a hypohalite in the presence of a base in a solvent for the reaction mixture to produce the protected 3-amino-1,2-dihydroxypropane acetal.

6,040,465

PROCESS FOR PRODUCING OPTICALLY ACTIVE β-LACTONES

Sotaro Miyano; Tetsutaro Hattori, both of Sendai; Osamu Uesugi, Yokohama; Yasufumi Tamai, Sendai, and Noboru Sayo, Hiratsuka, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Mar. 10, 1999, Appl. No. 265,371

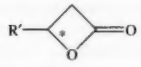
Claims priority, application Japan, Mar. 11, 1998, 10-101674

Int. Cl.[7] C07D *305/12;* **B01J** *20/00*

U.S. Cl. 549—510 **2 Claims**

1. A process for producing an optically active β-lactone of formula (I):

(I)



wherein R^1 is an alkyl group having 1–9 carbon atoms which is optionally branched or a cycloalkyl group having 5–7 carbon atoms; the process comprising reacting an aldehyde of formula (II):

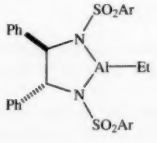
R^1CHO (II)

wherein R^1 is the same as defined above, with a ketene of formula (III):

$CH_2=C=O$ (III)

in the presence of a bissulfonamide/aluminum complex of formula (IV):

(IV)



wherein Ar is 2,4,6-$(R^2)_3C_6H_2$, wherein R^2 is an alkyl group having 2–4 carbon atoms, Et is an ethyl group and Ph is a phenyl group.

6,040,466

TAXOIDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hervé Bouchard, Thiais; Jean-Dominique Bourzat, Vincennes, and Alain Commerçon, Vitry-sur-Seine, all of France, assignors to Rhone Poulenc Rorer SA, Antony, France

Continuation-in-part of application No. 08/913,972, Sep. 26, 1997, and a continuation of application No. PCT/FR96/00441, Mar. 25, 1996. This application Mar. 17, 1999, Appl. No. 271,300.

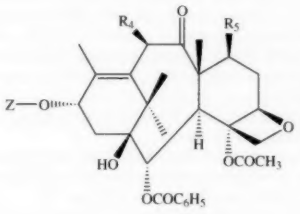
This patent is subject to a terminal disclaimer.

Int. Cl.[7] C07D *305/14*

U.S. Cl. 549—510 **12 Claims**

1. A taxoid of general formula:

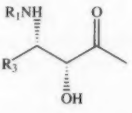
(I)



in which:

Z represents a hydrogen atom or a radical of general formula:

(II)



in which:

R_1 represents a benzoyl radical unsubstituted or substituted with one or more identical or different atoms or radicals selected from halogen atoms, and alkyl radicals containing 1 to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms or trifluoromethyl radicals, a thenoyl radical, a furoyl radical, and a radical R_2—O—C(=O)— in which

R_2 represents an alkyl radical containing 1 to 8 carbon atoms, an alkenyl radical containing 2 to 8 carbon atoms, an alkynyl radical containing 3 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms, a phenyl radical, which is unsubstituted or substituted with one or more atoms or radicals selected from halogen atoms, alkyl radicals containing 1 to 4 carbon atoms, and alkoxy radicals containing 1 to 4 carbon atoms, cyano radicals, carboxyl radicals, and alkoxycarbonyl radicals in which the alkyl portion contains 1 to 4 carbon atoms;

a phenyl or an α- or β-naphthyl radical, which is unsubstituted or substituted with one or more atoms or radicals selected from halogen atoms, alkyl radicals containing 1 to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms, and a 5-membered aromatic heterocyclic radical;

R_3 represents a phenyl radical;

R_4 represents an alkanoyloxy radical in which the alkanoyl portion contains 2 to 6 carbon atoms in an unbranched or branched chain, this radical unsubstituted or substituted with one or more halogen atoms, or with an alkoxy radical containing 1 to 4 carbon atoms, or alternatively, R_4 represents a cycloalkanoyloxy radical in which the cycloalkanoyl portion contains 4 to 8 carbon atoms, or alternatively, R_4 represents a benzoyloxy radical;

R_5 represents an alkoxy radical containing 1 to 4 carbon atoms in an unbranched or branched chain, substituted by an alkylthio radical containing 1 to 4 carbon atoms.

6,040,467

HIGH PURITY OXYGEN FOR ETHYLENE OXIDE PRODUCTION

Vasilis Papavassiliou, Kent; Matthew Lincoln Wagner, White Plains, both of N.Y., and Roger William Day, Southbury, Conn., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 24, 1997, Appl. No. 899,706

Int. Cl.[7] C07D *301/10;301/03*

U.S. Cl. 549—534 **8 Claims**

1. A method for enhancing the yield of ethylene oxide by reducing the presence of argon during ethylene oxide production, said method comprises

a) combining ethylene, high purity gas containing at least 99.5% oxygen and a ballast gas with a recycle gas to form a gaseous reaction mixture;

b) feeding said reaction mixture into a catalyst filled reactor such that an effluent emerges therefrom;

c) passing at least a portion of said effluent from said reactor to a recovery unit to selectively remove ethylene oxide, thereby forming an ethylene oxide depleted gas stream;

d) passing at least a portion of the ethylene oxide depleted gas stream to a stripping unit to selectively remove carbon dioxide therefrom;

e) passing at least a portion of the carbon dioxide depleted gas stream to purge and the remaining portion to recycle as a recycle gas;

f) recompressing the recycle gas; and

g) adjusting the flow of the purge stream to effectively reduce the concentration of argon.

6,040,468

METHOD OF PREPARING 16α, 17α-DIALKYLATED STEROIDS

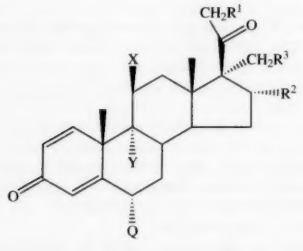
Raymond E. Conrow, Crowley, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Provisional application No. 60/067,148, Dec. 2, 1997. This application Nov. 5, 1998, Appl. No. 186,975.

Int. Cl.[7] C07J *9/00;5/00;7/00;7/00;71/00*

U.S. Cl. 552—543 **9 Claims**

1. A method of preparing a 16α, 17α-dialkylated steroid of the formula



wherein R^1 is H or CHR^4R^5;

R^2 is C_1–C_4 alkyl;

R^3 is H, C_1–C_3 alkyl, C≡CH, CH=CH_2, or phenyl;

X is $OSiR^7R^8R^9$ or OC(=O)R^6;

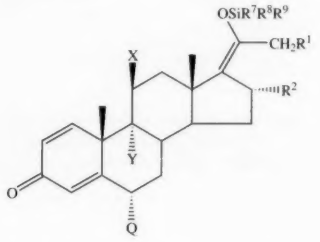
Y is H, F, or Cl; or X and Y taken together are a covalent bonds; or X and Y taken together form an epoxide group;

R^4, R^5 and R^6 are independently H or C_1–C_4 alkyl;

R^7, R^8 and R^9 are independently C_1–C_4 alkyl; and

Q is H or CH_3;

comprising reacting in a solvent an enol silyl ether of the formula



with an enol silyl ether cleaving agent and an alkylating agent of the formula R^3CH_2Z

wherein

R^3 is selected from the group consisting of hydrogen, a primary alkyl group of up to three carbon atoms total, an ethenyl group, an ethynyl group, and a phenyl group; and

Z is Cl, Br or I.

6,040,469

METALLOCENE COMPOUND

Michael Riedel, Essen; Thomas Weller, Mainz; Alexandra Jacobs, Frankfurt; Wolfgang Anton Herrmann, Freising, and Markus Morawietz, Hanau, all of Germany, assignors to Targor GmbH, Germany

Filed Dec. 12, 1996, Appl. No. 764,526

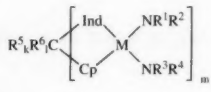
Claims priority, application Germany, Dec. 13, 1995, 195 46 501

Int. Cl.[7] C07F *17/00*

U.S. Cl. 556—53 **19 Claims**

1. A metallocene compound of the formula I:

(I)



where

Cp is an unsubstituted or substituted cyclopentadienyl group,

Ind is an unsubstituted or substituted indenyl group, wherein the substituted indenyl group is substituted with a hydrocarbon which can optionally contain a heteroatom,

M is a tetravalent metal,

R^1, R^2, R^3 and R^4 are, independently of one another, identical or different and are each a hydrogen atom or a C_1–C_{20}-hydrocarbon radical,

R^5 and R^6 are, independently of one another, identical or different and are each a hydrogen atom or a C_1–C_{30}-hydrocarbon radical,

m is 1 or 2,

k and l are each 1 when m is 1, and

k and l are each zero when m is 2,

with the proviso that Cp is not identical to Ind, and if a substituted or unsubstituted fluorenyl group is present, it must fall under the substituted Cp designation, and not under the substituted Ind designation.

6,040,470

SULFONYL COMPOUND AND THERMALSENSITIVE RECORDING MEDIUM USING THE SAME

Shigeru Oda, and Eiji Kawabata, both of Osaka, Japan, assignors to Sanko Kaihatsu Kagaku Kenkyusho, Osaka, Japan

Division of application No. 08/801,255, Feb. 19, 1997, Pat. No. 5,840,652. This application Sep. 10, 1998, Appl. No. 150,943.

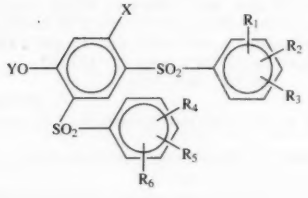
Claims priority, application Japan, Feb. 21, 1996, 8-033508

Int. Cl.[7] C07C *309/10;317/14*

U.S. Cl. 558—58 **2 Claims**

1. A sulfonyl compound represented by the following general formula (1):

(1)



wherein X represents hydrogen atom or an alkyl group of 1–4 carbon atoms; R_1, R_2, R_3, R_4, R_5 and R_6 which may be the same or different, represent a hydrogen atom, a halogen atom or an alkyl group of 1–4 carbon atoms; and Y represents an alkyl group, an aralkyl group, an allyl group, a cyclohexyl group, an alkyl group-substituted or non-substituted aryl group, an alkylsulfonyl group, a benzenesulfonyl group, an alkylbenzenesulfonyl group, an alkyloyl group, a benzoyl group, an alkylbenzoyl group, an acryloyl group, a metacryloyl group or a glycidyl group.

6,040,471

METHOD FOR PREPARING CERTAIN ACETONITRILES

Ann Marie Diederich, Downington, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of application No. 08/952,255, filed as application No. PCT/US96/07108, May 16, 1996, abandoned. This application Oct. 15, 1998, Appl. No. 173,268.

Claims priority, application United Kingdom, May 17, 1995, 9509930

Int. Cl.[7] C07C *253/00*

U.S. Cl. 558—315 **4 Claims**

1. A process for converting a benzaldehyde to a cyanohydrin in an aqueous medium comprising first adding about 1 to 1.5 equivalents of an alkali metal bisulfite to a solution of the benzaldehyde, then adding an alkali metal cyanide to this mixture, and then adding a second charge of about 1.5 to 2.5 equivalents of the alkali metal bisulfite while maintaining the pH between about 6.5 to 7.5 and maintaining the temperature of the reaction mixture at between about 0 and 30° C.

6,040,472

CATALYST FOR USE IN PRODUCING CARBOXYLIC ESTERS

Setsuo Yamamatsu, Fuji; Tatsuo Yamaguchi, Shizuoka-ken, both of Japan, and Koshiro Yokota, Pasadena, Calif., assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP96/02008, § 371 Date Oct. 23, 1997, § 102(e) Date Oct. 23, 1997, PCT Pub. No. WO97/03751, PCT Pub. Date Feb. 6, 1997

PCT Filed Jul. 18, 1996, Appl. No. 945,308

Claims priority, application Japan, Jul. 18, 1995, 7-181547; Jul. 19, 1995, 7-182721

Int. Cl.[7] C07C *69/74;* **B01J** *31/00*

U.S. Cl. 560—210 **30 Claims**

1. A catalyst for use in producing a carboxylic ester from an aldehyde, an alcohol and molecular oxygen, which comprises a carrier having supported thereon palladium and lead in a Pd/Pb atomic ratio (S) of $3/0.7 \leqq S \leqq 3/1.3$,

said catalyst exhibiting a maximum intensity peak at a diffraction angle (2θ) in the range of from 38.55° to 38.70° in a powder X-ray diffraction pattern thereof, wherein said peak is ascribed to the (111) crystal face diffraction of a Pd—Pb intermetallic compound.

6,040,473

PROCESS FOR THE PREPARATION OF POLYGLYCOL(METH)ACRYLATES

Joachim Knebel, Darmstadt, and Werner Spalt, Weiterstadt, both of Germany, assignors to Roehm GmbH, Darmstadt, Germany

PCT No. PCT/EP97/00056, § 371 Date Jul. 20, 1998, § 102(e) Date Jul. 20, 1998, PCT Pub. No. WO97/26293, PCT Pub. Date Jul. 24, 1997

PCT Filed Jan. 9, 1997, Appl. No. 101,761

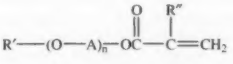
Claims priority, application Germany, Jan. 20, 1996, 196 02 035

Int. Cl.[7] C07C *67/03*

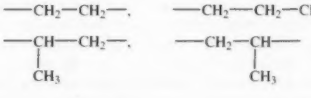
U.S. Cl. 560—217 **11 Claims**

1. Process for the production of (meth)acrylic acid esters of formula I

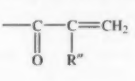
(I)



in which A stands for a radical selected from the group consisting of

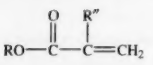


R' stands for a straight-chain or branched alkyl radical, optionally substituted with an aryl radical or an aryloxy radical, with 1 to 28 carbon atoms, or for a radical



R" stands for hydrogen or methyl, and

n stands for a whole number from 2 to 250, in a re-esterification reaction, characterized in that a (meth) acrylic acid ester of formula II



(II)

in which R stands for a lower alkyl radical, and R" has the meaning indicated above, is re-esterified in the presence of a re-esterification catalyst comprised of calcium hydroxide ($Ca(OH)_2$) or calcium hydroxide in combination with lithium chloride, with an alcohol of formula III

$$R'''—(O—A—)_n—OH \quad (III)$$

in which R''' stands for hydrogen or for the radical R' radical, and A and n have the meanings indicated above.

6,040,474

INTEGRATED PROCESS FOR THE PRODUCTION OF VINYL ACETATE AND/OR ACETIC ACID

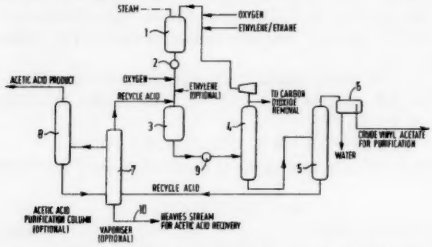
Simon Jobson, and Derrick John Watson, both of Hornsea, United Kingdom, assignors to BP Chemicals Limited, London, United Kingdom

Continuation of application No. PCT/GB97/02101, Aug. 5, 1997. This application Apr. 6, 1998, Appl. No. 55,398.

Claims priority, application United Kingdom, Aug. 7, 1996, 9616573

Int. Cl.[7] C07C *69/00*

U.S. Cl. 560—243 **15 Claims**



1. An integrated process for the production of acetic acid and/or vinyl acetate which comprises the steps:

(a) contacting in a first reaction zone a gaseous feed stock comprising ethylene and/or ethane and optionally steam with a molecular oxygen-containing gas in the presence of a catalyst active for the oxidation of ethylene to acetic acid and/or ethane to acetic acid and ethylene to produce a first gaseous product stream comprising acetic acid, water and ethylene, either as unreacted ethylene and/or as co-produced ethylene, and optionally also ethane, carbon monoxide, carbon dioxide and/or nitrogen;

(b) contacting in a second reaction zone in the presence of additional ethylene and/or acetic acid, at least a portion of the first gaseous product stream comprising at least acetic acid and ethylene and optionally also one or more of water, ethane, carbon monoxide, carbon dioxide and/or nitrogen with a molecular oxygen-containing gas in the presence of a catalyst active for the production of vinyl acetate to produce a second product stream comprising vinyl acetate, water, acetic acid and optionally ethylene;

(c) separating the product stream from step (b) by distillation into an overhead azeotrope fraction comprising vinyl acetate and water and a base fraction comprising acetic acid;

(d) either (i) recovering acetic acid from the base fraction separated in step (c) and optionally recycling the azeotrope fraction separated in step (c) after partial or complete separation of the water therefrom to step (c),

or (ii) recovering vinyl acetate from the azeotrope fraction separated in step (c) and optionally recycling the base fraction separated in step (c) to step (b),

or (iii) recovering acetic acid from the base fraction separated in step (c) and recovering vinyl acetate from the overhead azeotrope fraction recovered in step (c).

6,040,475

INTERMEDIATE COMPOUNDS FOR MAKING METABOLITES OF LYCOPENE

Hanspeter Pfander, Bern, and Bruno Traber, Münsingen, both of Switzerland, assignors to Roche Vitamins Inc., Nutley, N.J.

Division of application No. 09/168,143, Oct. 7, 1998. This application May 12, 1999, Appl. No. 310,280.

Claims priority, application European Pat. Off., Oct. 20, 1997, 97118144; Aug. 13, 1998, 98115249

Int. Cl.[7] C07C *67/02;49/105;35/06*

U.S. Cl. 560—264 **4 Claims**

1. 3-(1-Acetoxy-1-methylethyl)-6-oxo-heptanal.

6,040,476

CARBON DIOXIDE ASSISTED HYDROLYSIS OF AMINOPHOSPHONATES

Todd J. Johnson, O'Fallon, and William H. Miller, Glendale, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Provisional application No. 60/062,351, Oct. 15, 1997. This application Oct. 15, 1998, Appl. No. 173,103.

Int. Cl.[7] C07F *9/38*

U.S. Cl. 562—1 **48 Claims**

1. A process for producing an aminophosphonic acid comprising:

contacting an aqueous medium an aminophosphonate ester with base;

adding a hydrolysis facilitator selected from the group consisting of CO_2, CS_2 and COS; and

hydrolyzing the aqueous medium comprising the aminophosphonate ester, base, and hydrolysis facilitator at a temperature above about 50° C.

6,040,477

SULFODECHLORINATING AROMATIC COMPOUNDS

Habib Hichri, Snyder; Viesturs Lesins, Buffalo, and Christopher C. Sommer, North Tonawanda, all of N.Y., assignors to Occidental Chemical Corporation, Dallas, Tex.

Filed Dec. 3, 1998, Appl. No. 205,409

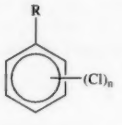
Int. Cl.[7] C07C *309/32;* **C07F** *11/00*

U.S. Cl. 562—46 **20 Claims**

1. A method of sulfodechlorinating an aromatic compound comprising

(A) preparing a composition of

(1) an aromatic compound having the general formula:



where R is CHO or COOH and n is 1 to 3;

(2) a sulfur-containing compound selected from the group consisting of alkali metal sulfites, alkali metal bisulfites, alkaline earth metal sulfites, and alkaline earth metal bisulfites, in an amount stoichiometric to about 20 mole % in excess of stoichiometric;

(3) water in an amount sufficient to form a solution of said sulfur-containing compound; and

(4) sufficient base to raise the pH of said solution to about 10 to about 14; and

(B) heating said composition at about 150 to about 200° C. where no catalyst is present in said composition.

6,040,478

PROCESS FOR DICARBOXYLATING DIHYDRIC PHENOLS

Doetze Jakob Sikkema, Oosterbeek, and Adrianus Maria Reichwein, Arnhem, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of application No. PCT/EP96/04611, Oct. 21, 1996. This application May 1, 1998, Appl. No. 71,782.

Claims priority, application Netherlands, Nov. 10, 1995, 1001628

Int. Cl.[7] C07C *51/15*

U.S. Cl. 562—424 **13 Claims**

1. A process for dicarboxylating dihydric phenols which comprises contacting the phenol with carbon dioxide in the presence of alkali metal carbonate, characterized in that the reaction is carried out in the presence of an alkali metal formate, at a temperature above the melting point of the formate.

6,040,479

RACEMIC SEPARATION OF KETAMINE

Klaus Steiner, Emmendingen; Stefan Gangkofner, Lahr, both of Germany, and Jean-Marie Grunenwald, Kertzfeld-Benfeld, France, assignors to Goedecke Aktiengesellschaft, Berlin, and Cu Chemie Uetikon GmbH, Lahr, both of Germany

PCT No. PCT/EP97/02360, § 371 Date Nov. 10, 1998, § 102(e) Date Nov. 10, 1998, PCT Pub. No. WO97/43244, PCT Pub. Date Nov. 20, 1997

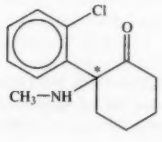
PCT Filed May 7, 1997, Appl. No. 180,530

Claims priority, application Germany, May 15, 1996, 196 19 665

Int. Cl.[7] C07B *57/00*

U.S. Cl. 564—304 **12 Claims**

1. Process for the resolution of racemic 2-(o-chlorophenyl)-2-methylaminocyclohexanone of the formula:



wherein * is an asymmetric carbon atom, which comprises the following steps:

1) reaction of racemic 2-(o-chlorophenyl)-2-methylaminocyclohexanone with an enantiomeric form of tartaric acid,

2) isolation of the formed tartaric acid salt of 2-(o-chlorophenyl)- 2-methylaminocyclohexanone and

3) reaction of the isolated tartaric acid salt of 2-(o-chlorophenyl)- 2-methylaminocyclohexanone with an alkali, whereby an isomer of 2-(o-chlorophenyl)-2-methylaminocyclohexanone can be isolated,

wherein steps 1 and 2 are carried out in water or in a mixture of water and an alcohol and/or ketone, ether or ester.

6,040,480

ASYMMETRIC SYNTHESIS OF BENZOXAZINONES

Michael E. Pierce, Wilmington, Del.; Cheng Y. Chen, Colonia, N.J.; Anusuya Choudhury, Landenberg, Pa.; Lilian A. Radesca, Newark, Del.; Lushi Tan, Edison, and Dalian Zhao, Fanwood, both of N.J., assignors to Du Pont Pharmaceuticals Company, Wilmington, Del.

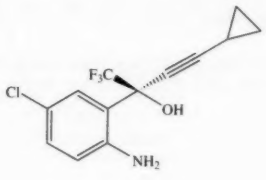
Division of application No. 09/055,480, Apr. 6, 1998, Pat. No. 5,925,789, Provisional application No. 60/042,803, Apr. 7, 1997. This application Feb. 11, 1999, Appl. No. 248,567.

Int. Cl.[7] C07C *215/00*

U.S. Cl. 564—390 **3 Claims**

1. A process for the preparation of an amino alcohol compound of formula (V-i):

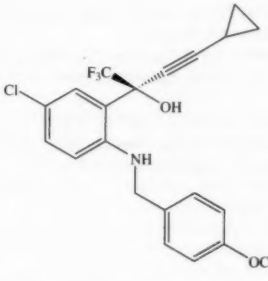
(V-i)



comprising

(1) adding a toluene solution of 2,3-dichloro-5,6-dicyano-1,4-benzoquinone to a toluene solution of a compound of formula (III-i):

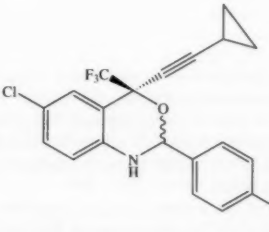
(III-i)



while maintaining a reaction temperature of about 0° C. to about 10° C.;

(2) maintaining the reaction temperature at about 0° C. for about 1 hour to form a toluene slurry of 2,3-dichloro-5,6-dicyano-1,4-dihydroxybenzene and a compound of formula (IV-i):

(IV-i)



(3) filtering the slurry to remove the 2,3-dichloro-5,6-dicyano-1,4-dihydroxybenzene;

(4) washing the 2,3-dichloro-5,6-dicyano-1,4-dihydroxybenzene waste cake with toluene;

(5) combining the filtrate and toluene washings;

(6) concentrating in vacuo the filtrate and toluene solution of the compound of formula (IV-i) with methanol to remove most of the toluene;

(7) adding dropwise to the compound of formula (IV-i) in methanol at a temperature of about 40° C. to about 45° C. an aqueous solution of sodium hydroxide forming a clear solution of the amino alcohol and p-methoxy-benzaldehyde;

(8) adding dropwise to the clear solution of the amino alcohol a solution of $NaBH_4$ in an aqueous solution of sodium hydroxide maintaining a reaction temperature of about 40° C. to about 45° C.;

(9) stirring the reaction mixture for about 30 minutes;

(10) neutralizing the reaction with glacial acetic acid to a pH of about 8 to about 9;

(11) adding water to form a slurry;

(12) cooling the slurry to about −15° C. to about 0° C. for about 1 hour; and

(13) filtering the cooled slurry of the amino alcohol and washing with water to give the crude crystalline amino alcohol as a pale yellow solid.

6,040,481

METHOD FOR HYDROGENATING AROMATIC NITRO COMPOUNDS

Bernard Chambost, Lyons; Philippe Marion, Villeurbanne, and Corinne Mathieu, Lyons, all of France, assignors to Rhodia Chimie, Courbevoie, France

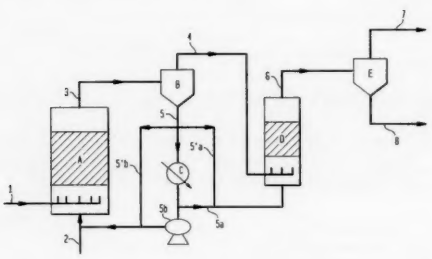
PCT No. PCT/FR96/01893, § 371 Date Nov. 12, 1998, § 102(e) Date Nov. 12, 1998, PCT Pub. No. WO97/20804, PCT Pub. Date Jun. 12, 1997

PCT Filed Nov. 29, 1996, Appl. No. 77,637

Claims priority, application France, Dec. 1, 1995, 95 14203

Int. Cl.[7] C07C *209/00*

U.S. Cl. 564—422 **21 Claims**



1. A process for hydrogenating aromatic nitro compounds through a hydrogenation reaction, comprising the steps of:

a) reacting at least one aromatic nitro compound With hydrogen in two fixed-bed catalytic reactors in series and comprising a first reactor and a second reactor operating adiabatically to obtain a reaction mixture;

b) recycling a part of the reaction mixture leaving the first reactor into this first reactor, and introducing the other part into the second reactor; and

c) supplying each of the reactors with hydrogen, at least one aromatic nitro compound, or the recycled or non-recycled reaction mixture, co-currentwise, in order to obtain a continuous liquid phase in said reactors.

6,040,482

OXYALKYLENE-SUBSTITUTED AMINOPHENOL INTERMEDIATE

Philip G. Harris, and Rajnish Batlaw, both of Spartanburg, S.C., assignors to Milliken & Company, Spartanburg, S.C.

Filed Mar. 5, 1999, Appl. No. 263,902

Int. Cl.[7] C07C *215/00;211/00*

U.S. Cl. 564—443 **15 Claims**

1. An aminophenol intermediate comprising at most a total of three moles of a constituent selected from the group of oxyalkylenes having from 3 to 12 carbon atoms, alkoxyalkylesters having from 3 to 12 carbon atoms, glycidol, and a glycidyl group wherein said constituent is solely bonded to the amine.

6,040,483

PROCESS FOR HYDROFORMYLATING OLEFINS

Helene Olivier, Rueil Malmaison; Dominique Commereuc, Meudon, and Sebastien Drochon, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison Cedex, France

Filed May 27, 1998, Appl. No. 84,352

Claims priority, application France, May 27, 1997, 97 06.570

Int. Cl.[7] C07C *45/50*

U.S. Cl. 568—454 **18 Claims**

1. A process comprising conducting a liquid-phase hydroformylation of at least one internal olefin by carbon monoxide and hydrogen in the presence of a catalytic composition that contains at least one compound of a transition metal other than ruthenium, a phosphorous-containing ligand consisting essentially of at least one phosphine oxide of the formula $R_1R_2R_3PO$ wherein R_1 R_2 and R_3 being identical or different represent hydrocarbyl of 1–12 carbon atoms, and at least one organic-inorganic salt that does not contain tin or germanium; said salt is at least one quaternary ammonium salt and/or at least one quaternary phosphonium salt of general formula Q^+A^-, in which Q^+ represents an ammonium and/or a quaternary phosphonium and A^- represents an anion wherein A^- is tetrafluoroborate providing that Q^+represent quaternary ammonium or anion A^- is selected from the group consisting of hexafluorophosphate, hexafluoroantimonate, hexafluoroarsenate, fluorosulphonate, bis-perfluoroalkylsulphonyl amides, perfluoroalkyl sulphonates, dichlorocuprate, tetrachloroborate, tetrachloroaluminate, and trichlorozincate so as to produce selectively aldehydes at high conversion rates of said internal olefins in an organic phase, and to produce a polar phase containing at least part of the catalyst.

6,040,484

PHENOL COMPOUND HYDROXYLATION METHOD

Michel Costantini; Laurent Gilbert, and Michel Spagnol, all of Lyons, France, assignors to Rhodia Chimie, Courbevoie, France

PCT No. PCT/FR97/00223, § 371 Date Aug. 13, 1998, § 102(e) Date Aug. 13, 1998, PCT Pub. No. WO97/29066, PCT Pub. Date Aug. 14, 1997

PCT Filed Feb. 5, 1997, Appl. No. 125,163

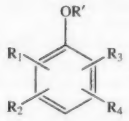
Claims priority, application France, Feb. 9, 1996, 96 01596

Int. Cl.[7] C07C *37/60*

U.S. Cl. 568—803 **42 Claims**

1. A process for hydroxylating a phenolic compound with hydrogen peroxide through a hydroxylation reaction, comprising the step of carrying out said hydroxylation reaction in the presence of an effective quantity of a catalyst to catalyze said hydroxylation reaction comprising a triflate of a rare earth element, of scandium or of bismuth, wherein the phenolic compound corresponds to the general formula (I):

(I)



wherein:

R' represents a hydrogen atom, a saturated or unsaturated linear or branched acyclic or aliphatic hydrocarbon radical having 1 to 24 carbon atoms, a saturated or unsaturated monocyclic or polycyclic cycloaliphatic radical, or a saturated or unsaturated linear or branched aliphatic radical bearing a cyclic substituent, and

R_1, R_2, R_3 and R_4, are identical or different, and represent:

a hydrogen atom,

a linear or branched alkyl radical having 1 to 6 carbon atoms,

a linear or branched alkenyl radical having 2 to 6 carbon atoms,

a linear or branched alkoxy radical having 1 to 6 carbon atoms,

an acyl group having 2 to 6 carbon atoms, or

a radical having the formula:

R_5—OH,

R_5—$COOR_6$,

R_5—X, or

R_5—CF_3,

wherein R_5 represents a valency bond or a linear or branched, saturated or unsaturated divalent hydrocarbon radical having 1 to 6 carbon atoms; R_6 represents a hydrogen atom or a linear or branched alkyl radical having 1 to 6 carbon atoms;

x represents a halogen atom, optionally, two groups R_1 and R_2 and R_3 and R_4 placed on two vicinal carbon atoms, together and with the carbon atoms bearing them, form a benzene ring.

6,040,485

FLUORINATED ORGANIC COMPOUNDS, OPHTHALMOLOGICAL APPLICATIONS THEREOF AND METHOD FOR MAKING SAME

Isabelle Lattes, Ramonville Saint Agne; Bernard Feurer, Montlaur; Brigitte Guidetti, Flourens, and Viviane Payrou, Toulouse, all of France, assignors to Chauvin Opsia, Castanet Tolosan, France

PCT No. PCT/FR95/01131, § 371 Date Feb. 26, 1998, § 102(e) Date Feb. 26, 1998, PCT Pub. No. WO97/08118, PCT Pub. Date Mar. 6, 1997

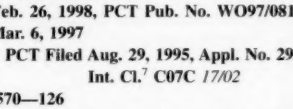
PCT Filed Aug. 29, 1995, Appl. No. 29,486

Int. Cl.[7] **C07C** *17/02*

U.S. Cl. 570—126 **16 Claims**

1. The branched fluorinated compound with the following molecular structure:

(2)



where R_F is a perfluorinated chain having the formula C_pF_{2p+1} with $2 \leq p \leq 12$, and the groups R', R" and R'", identical or not, have each the following formula: $(CH_2)_m$—C_xH_y, with:

$n \geq 0$

$m \geq 0$

$y=2x+1$ with $x \geq 0$

at least two of the groups R', R" and R'" not being hydrogen atoms,

the total number of carbon atoms of the groups R', R" and R'" being lower than 25–n.

6,040,486

PROCESS FOR THE MANUFACTURE OF 2-CHLORO-1,1,1-TRIFLUOROETHANE

David Richard Corbin, West Chester, Pa., and V. N. Mallikarjuna Rao, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application No. 07/672,875, Mar. 20, 1991, abandoned. This application Dec. 20, 1993, Appl. No. 167,656.

Int. Cl.[7] **C07C** *17/08*

U.S. Cl. 570—168 **20 Claims**

1. A process for producing 2-chloro-1,1,1-trifluoroethane comprising the step of reacting a trihaloethene of the formula CX_2=CHCl wherein each X is chlorine or fluorine, with HF in the gaseous phase at an elevated temperature in the presence of a supported metal catalyst; wherein said catalyst is a catalyst of metal fluoride on a fluorinated alumina support having an atomic ratio of F to Al of at least 2.7:1 and containing β-aluminum fluoride; wherein said supported metal includes zinc and optionally includes one or more other metals selected from Groups VIII, VIIB, VIB, IIIB, IIB and IB of the Periodic Table and elements having atomic numbers between 57 and 71; and wherein zinc is at least about 0.1 percent by weight of the catalyst and is at least about 40 percent by weight of the metal on said support.

6,040,487

PROCESS FOR THE MANUFACTURE OF HALOCARBONS

Ralph Thomas Baker, Los Alamos, N. Mex.; Viacheslav Alexandrovich Petrov, Hockessin, and Velliyurnott Mallikarjuna Rao, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US96/12548, § 371 Date Jan. 28, 1998, § 102(e) Date Jan. 28, 1998, PCT Pub. No. WO97/05090, PCT Pub. Date Feb. 13, 1997

Provisional application No. 60/001,702, Aug. 1, 1995. This PCT application Jul. 31, 1996, Appl. No. 11,402.

Int. Cl.[7] **C07C** *21/18;17/32;255/00;69/63*

U.S. Cl. 570—172 **19 Claims**

1. A liquid phase process for producing halogenated alkane adducts of the formula $CAR^1R^2CBR^3R^4$ wherein

R^1, R^2, R^3, and R^4 are each independently selected from the group consisting of H, Br, Cl, F, C_1–C_6 alkyl, CN, CO_2CH_3, CH_2Cl, and aryl, provided that only two of R^1, R^2, R^3, and R^4 can be selected from C_1–C_6 alkyl, CN, CO_2CH_3, CH_2Cl, and aryl;

A is selected from the group consisting of CX_3, $CH_{3-a}X_a$, $C_nH_{(2n+1)-b}X_b$ and $CH_cX_{2-c}R$, where R is $C_nH_{(2n+1)-b}X_b$, each X is independently selected from the group consisting of Br, Cl and I, a is an integer from 0 to 3, n is an integer from 1 to 6, b is an integer from 1 to 2n+1, and c is an integer from 0 to 1; and

B is selected from the group consisting of Br, Cl and I;

provided that (1) when A is CX_3 then only one of X is I, (2) when A is $CH_{3-a}X_a$ then each X is B and a is an integer from 1 to 2 when B is Br, a is 2 when B is Cl, and a is an integer from 0 to 2 when B is I, and (3) when A is $C_nH_{(2n+1)-b}X_b$ then each X is independently selected from Cl and F and B is I, comprising:

contacting a halogenated alkane of the formula AB with an olefin of the formula $CR^1R^2{=}CR^3R^4$ in the presence of a catalyst system containing (i) at least one catalyst selected from the group consisting of monovalent and divalent copper, and (ii) at least one promoter selected from the group consisting of pyridazines, pyrazines, and aliphatic heterocyclic compounds which contain at least one carbon-nitrogen double bond in the heterocyclic ring.

6,040,488

STABILIZATION OF VINYLIDENE CHLORIDE

Domenick V. Amato, Paducah, Ky., and Earl M. Gorton, Sulphur, La., assignors to PPG Industries Ohio, Inc., Cleveland, Ohio

Filed Jun. 2, 1998, Appl. No. 88,819
Int. Cl.[7] C07C *17/42*
U.S. Cl. 570—264 **21 Claims**

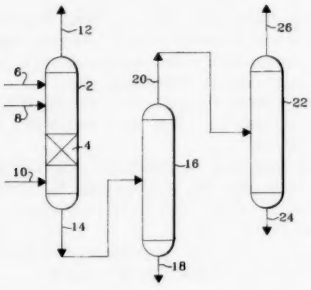
1. A composition comprising vinylidene chloride and a stabilizing amount of free radical stabilizer having at least one 2,2,6,6-tetra(lower alkyl)-1-piperidinyloxy-yl free radical group.

6,040,489

1,3-BUTADIENE SEPARATION FROM A CRUDE C_4 STREAM USING CATALYTIC EXTRACTIVE DISTILLATION

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP LLC, Des Plaines, Ill.

Filed Dec. 9, 1998, Appl. No. 208,232
Int. Cl.[7] C07C *5/03;5/02;7/10*
U.S. Cl. 585—260 **7 Claims**



1. A process for separating 1,3-butadiene from a crude C_4 stream containing butanes, butenes, butadienes and acetylenes, said process comprising

a) introducing hydrogen, a solvent, and the crude C_4 stream to a catalytic extractive distillation unit having a reaction zone containing a catalyst capable of hydrogenating acetylenes, to distill an overhead stream containing at least butanes and butenes from an extract stream containing at least solvent and butadienes with concurrent hydrogenation of acetylenes to form hydrogenation products;

b) introducing the extract stream to a solvent stripping column to distill a solvent bottoms stream from a butadiene overhead stream: and

c) introducing the butadiene overhead stream to a butadiene distillation column to distill a 1,3-butadiene overhead stream from a 1,2-butadiene bottoms stream.

6,040,490

PROCESS FOR PRODUCING AROMATIC COMPOUNDS BY DEALKYLATION, TRANSALKYLATION, OR DISPROPORTIONATION

Ryoji Ichioka; Shinobu Yamakawa, both of Aichi; Hirohito Okino, Shiga; Hajime Kato; Kazuyoshi Iwayama, both of Aichi; Hiroshi Konta, Mie, and Akira Kitamura, Aichi, all of Japan, assignors to Toray Industries, Inc., Japan

Continuation-in-part of application No. 08/955,870, Oct. 22, 1997, Pat. No. 5,847,256, which is a continuation of application No. 08/608,187, Feb. 28, 1996, abandoned. This application Aug. 12, 1998, Appl. No. 132,654.
Claims priority, application Japan, Mar. 6, 1995, 7-74587
This patent is subject to a terminal disclaimer.
Int. Cl.[7] C07C *5/22;4/12;2/66*
U.S. Cl. 585—475 **14 Claims**

1. A process for conversion of aromatic hydrocarbons, which comprises bringing feedstock containing from 5 to 50% by weight of an aromatic hydrocarbon having an ethyl group and a C_9 alkyl aromatic hydrocarbon into contact with a catalyst capable of disproportionation, trans-alkylation and dealkylation, in the presence of hydrogen, a secondary particle diameter of a zeolite in the catalyst being 10 μm or less.

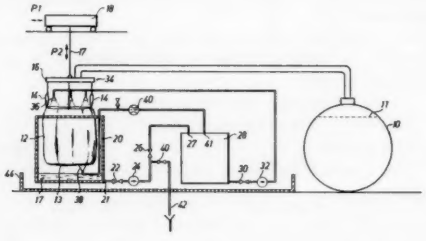
14. A process for conversion of aromatic hydrocarbons, which comprises bringing feedstock containing from 5 to 50% by weight of an aromatic hydrocarbon having an ethyl group and a C_9 alkyl aromatic hydrocarbon into contact with a catalyst capable of disproportionation, trans-alkylation and dealkylation, a secondary particle diameter of a zeolite in the catalyst being 10 μm or less, wherein the reaction is performed in the presence of hydrogen at a temperature of from 300 to 550° C. and a pressure of from 1 to 6 MPa with WHSV of from 0.5 to 10 hr^{-1} at a hydrogen to aromatic hydrocarbon molar ratio of from 1 to 10.

6,040,491

METHOD AND APPARATUS HANDLING RADIOACTIVE WASTE MATERIAL

Sony Sjöwall, Varberg, Sweden, assignor to Vattenfall AB, Stockholm, Sweden

PCT No. PCT/SE96/00306, § 371 Date Sep. 30, 1997, § 102(e) Date Sep. 30, 1997, PCT Pub. No. WO96/28828, PCT Pub. Date Sep. 19, 1996
PCT Filed Mar. 7, 1996, Appl. No. 913,047
Claims priority, application Sweden, Mar. 10, 1995, 9500881
Int. Cl.[7] G21F *9/00;9/04*
U.S. Cl. 588—16 **21 Claims**



1. A method for dewatering and containing radioactive, aqueous waste, comprising the steps of:

introducing radioactive, aqueous waste into a filtration container, the filtration container being an inner sack having a bottom provided with a straining cloth;

dewatering the waste in the inner sack such that substantially all dewatering of the waste is carried out through the straining cloth;

recirculating filtration water resulting from dewatering the waste through the waste in the inner sack for cleaning of the filtration water;

sealing the inner sack after dewatering the waste; and

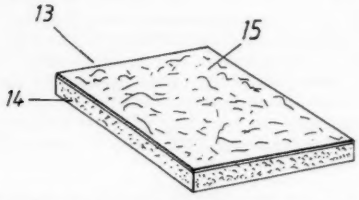
disposing of dewatered waste in a disposable container structure including the inner sack holding the dewatered waste and an outer container enclosing the inner sack.

6,040,492

METHOD OF SECURING A LIQUID IMPERVIOUS SHEET TO A WOUND PAD

Bengt W. Lindquist, Lerum, and Tomas Fabo, Mölnlycke, both of Sweden, assignors to Molnlycke Health Care AB, Gothenburg, Sweden

Filed Feb. 18, 1998, Appl. No. 25,455
Claims priority, application Sweden, Feb. 20, 1997, 9700600
Int. Cl.[7] A61F *13/00*
U.S. Cl. 602—41 **4 Claims**



1. A method of fastening a liquid-impervious sheet to a wound pad that is comprised of an elastic, hydrophilic material and that will expand in all directions when absorbing fluid, the method comprising:

stretching the pad to a given extent in both a longitudinal and transverse direction of a longitudinal plane of the pad by applying a load to the pad so as to obtain a stretched pad;

fastening a flat liquid-impervious sheet to the stretched pad; and

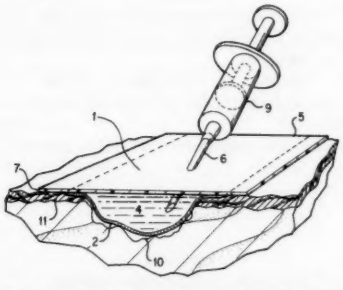
relieving the load acting on the pad thereby allowing the pad to contract, and cause the fastened liquid-impervious sheet to form a plurality of projections by puckering of the sheet.

6,040,493

BIOREACTOR WOUND DRESSING

Randolph L. Cooke, East Amwell Township, Hunterdon County, and Vladimir A. Stoy, Princeton Township, Mercer County, both of N.J., assignors to Replication Medical, Inc., Rocky Hill, N.J.

Filed Apr. 24, 1998, Appl. No. 66,146
Int. Cl.[7] A61F *13/00*
U.S. Cl. 602—41 **13 Claims**



1. A method of wound treatment comprising the following steps:

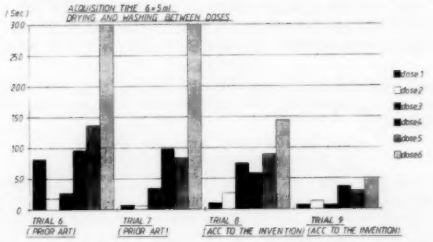
a) placing a wound dressing comprising a first layer being a transport layer in the direct contact with a wound and including at least one layer of a permeable polymeric media containing, in equilibrium with body fluids, at least 40% by weight of liquid, being impermeable for infectous agents of any kind and being permeable to water soluble substances having molecular weight up to at least 1000 Daltons; and,a second layer being a fluid reservoir layer that is adjacent to the transport layer and is capable of containing between 40% and 100% of its volume of an aqueous liquid, wherein the transport layer and reservoir layer are permeably interconnected for aqueous solutions and are in a substantial osmotic equilibrium and, wherein said transport layer has at least one cultivation surface that is adhesive.

6,040,494

FOAM MATERIAL ITS MANUFACTURING METHOD AND USE AND AN ABSORBENT DISPOSABLE ARTICLE COMPRISING SUCH A FOAM MATERIAL

Pia Kalentun; Anette Buschka, both of Göteborg; Andrea Schmid, Mölnlycke, and Eva Strömbom, Mölndal, all of Sweden, assignors to SCA Hygiene Products AB, Gothenburg, Sweden

Filed May 12, 1998, Appl. No. 76,071
Claims priority, application Sweden, May 15, 1997, 9701807
Int. Cl.[7] A61F *13/15;* **C08J** *9/26;9/28*
U.S. Cl. 604—369 **13 Claims**



1. A foam material for absorption of aqueous liquids, comprising a polymeric foam structure which is elastically formable, said foam structure comprising a plurality of cells formed by a plurality of internal surfaces of said foam structure, wherein said cells essentially are open and essentially in connection with each other when absorption of liquid is initiated, wherein the foam structure in connection to the internal surfaces comprises a surfactant which is a nonionic block copolymer, wherein said surfactant comprises poly(12-hydroxy-stearic acid), and that said internal surfaces essentially are hydrophilic.

6,040,495

HAIRLESS MOUSE SENSITIVE TO *HELICOBACTER PYLORI*

Nobutake Kimura; Masato Ariga, both of Ohimachi; Hirohito Yamakawa, Nishinasuno-machi; Yoshio Nakagawa, and Akio Shimizu, both of Ohimachi, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1998, Appl. No. 47,309
Claims priority, application Japan, Mar. 25, 1997, 9-071723
Int. Cl.[7] A01K *67/00*
U.S. Cl. 800—8 **6 Claims**

1. A NS:Hr/ICR hairless mouse whose embryos are deposited with the American Type Culture Collection (ATCC) under accession number ATCC 72024; wherein said mouse is susceptible to *Helicobacter pylori* infection by oral administration and capable of sustaining *Helicobacter pylori* alimentary infection, and wherein said mouse is characterized by the following biochemical marker genes:

Chromosome No.	Locus	Allelic Type
1	Idh1	a
1	Pep3	b

-continued

Chromosome No.	Locus	Allelic Type
1	Akp1	b
4	Mup1	a
4	Gpd1	b
5	Pgm1	b
6	Ldr1	a
7	Gpi1	a
7	Hbb	d
8	Es1	b
8	Es2	b
9	Modi	b
9	Trf	b
11	Bs3	c
14	Np1	a
17	Glo1	a.

6,040,496

USE OF TRANSLATIONALLY ALTERED RNA TO CONFER RESISTANCE TO MAIZE DWARF MOSAIC VIRUS AND OTHER MONOCOTYLEDONOUS PLANT VIRUSES

Marcus Dixon Law, Chapel Hill, and Jon M. Dietz, Apex, both of N.C., assignors to Novartis Finance Corporation, New York, N.Y.

Filed Jun. 30, 1995, Appl. No. 496,944

Int. Cl.[7] **A01H** *5/00;* **C12N** *5/04;15/82*

U.S. Cl. 800—280 **15 Claims**

12. A method for producing a monocotyledonous plant with an inheritable trait of resistance to infection by a maize dwarf mosaic virus comprising transforming said plant with a chimeric gene comprising a promoter functional in monocotyledonous plants operably linked to a coding sequence for a translationally altered RNA, wherein said translationally altered RNA comprises a messenger RNA sequence of said maize dwarf mosaic virus having a modification which renders said messenger RNA incapable of expressing a protein greater than twenty amino acids in length, wherein expression of said chimeric gene in said monocotyledonous plant inhibits infection by said maize dwarf mosaic virus.

6,040,497

GLYPHOSATE RESISTANT MAIZE LINES

Michael Spencer, Mystic, Conn.; Rita Mumm, Tolono, and Jeff Gwyn, Mahomet, both of Ill., assignors to Dekalb Genetics Corporation, Dekalb, Ill.

Filed Apr. 3, 1997, Appl. No. 832,078

Int. Cl.[7] **C12N** *15/00;15/82;* **A01H** *10/06;4/00*

U.S. Cl. 800—288 **63 Claims**

1. A fertile transgenic maize plant comprising a chromosomally integrated expression cassette comprising (i) a modified maize EPSPS gene encoding an EPSPS protein having isoleucine at position 102 and serine at position 106 and (ii) a promoter active in maize operably linked to said EPSPS gene, wherein the yield of said fertile transgenic maize plant is not affected by a glyphosate application rate that affects the yield of a maize plant lacking said modified maize gene, wherein said fertile transgenic maize plant comprises a transformation event selected from the group consisting of GA21, seed comprising said GA21 transformation event having been deposited as ATCC Accession Number 209033, FI117, seed comprising said FI117 transformation event having been deposited as ATCC Accession Number 209031, GG25, seed comprising said GG25 transformation event having been deposited as ATCC Accession Number 209032, and GJ11, seed comprising said GJ11 transformation event having been deposited as ATCC Accession Number 209030.

11. A method of preparing a fertile transgenic maize plant comprising:

(i) providing an expression cassette comprising (a) a modified maize EPSPS gene encoding an EPSPS protein having isoleucine at position 102 and serine at position 106 and (b) a promoter active in maize operably linked to said EPSPS gene;

(ii) contacting recipient maize cells with said expression cassette under conditions permitting the uptake of said expression cassette by said recipient cells;

(iii) selecting recipient cells comprising a chromosomally incorporated expression cassette;

(iv) regenerating plants from said selected cells; and

(v) identifying a fertile transgenic maize plant, the yield of which is not affected by a glyphosate application rate that affects the yield of a maize plant lacking said modified maize gene,

wherein said fertile transgenic maize plant comprises a transformation event selected from the group consisting of GA21, seed comprising said GA21 transformation event having been deposited as ATCC Accession Number 209033, FI117, seed comprising said FI117 transformation event having been deposited as ATCC Accession Number 209031, GG25, seed comprising said GG25 transformation event having been deposited as ATCC Accession Number 209032, and GJ11, seed comprising said GJ11 transformation event having been deposited as ATCC Accession Number 209030.

6,040,498

GENETICALLY ENGINEERED DUCKWEED

Anne-Marie Stomp, and Nirmala Rajbhandari, both of Raleigh, N.C., assignors to North Caroline State University, Raleigh, N.C.

Provisional application No. 60/055,474, Aug. 12, 1997. This application Aug. 11, 1998, Appl. No. 132,536.

Int. Cl.[7] **C12N** *5/04;15/82;15/84;* **A01H** *1/00*

U.S. Cl. 800—294 **65 Claims**

1. A method for stably transforming duckweed tissue with a nucleotide sequence of interest, the method comprising the steps of:

(a) inoculating a duckweed plant tissue with Agrobacterium comprising a vector which comprises a nucleotide sequence of interest; and

(b) co-cultivating the tissue with the Agrobacterium to produce stably transformed tissue.

6,040,499

SOYBEAN CULTIVAR 943347632294

Craig K. Moots, Taylorville, Ill., assignor to Monsanto Corporation, St. Louis, Mo.

Filed Mar. 25, 1998, Appl. No. 47,501

Int. Cl.[7] **A01H** *5/00;5/10;1/02;* **C12N** *5/04*

U.S. Cl. 800—312 **11 Claims**

1. A soybean seed designated 943347632294 and having ATCC Accession No. 203595.

6,040,500

SOYBEAN CULTIVAR CX433RR

Michael P. Conway, Plainfield, Ind., assignor to Dekalb Genetics Corporation, DeKalb, Ill.

Filed Jan. 15, 1999, Appl. No. 231,246

Int. Cl.[7] **A01H** *5/00;5/10;1/04;* **C12N** *5/04*

U.S. Cl. 800—312 **19 Claims**

1. Soybean seed designated CX433RR, wherein a sample of said seed has been deposited under accession number PTA-715.

6,040,501

SOYBEAN CULTIVAR B630518RR

Howard L. Gabe, Uberlândia-MG, Brazil, assignor to Novartis AG, Basel, Switzerland

Filed Feb. 12, 1999, Appl. No. 249,125

Int. Cl.[7] **A01H** *5/00;5/10;1/02;* **C12N** *5/04*

U.S. Cl. 800—312 **29 Claims**

1. Seed of soybean cultivar B630518RR having been deposited under ATCC Accession No: 203822.

6,040,502

SOYBEAN CULTIVAR C405323

Kevin Threlkeld, Washington, Iowa, and Donald McClure, Melbourne, Canada, assignors to Novartis AG, Basel, Switzerland

Filed Feb. 15, 1999, Appl. No. 250,233

Int. Cl.[7] **A01H** *5/00;5/10;1/02;* **C12N** *5/04*

U.S. Cl. 800—312 **29 Claims**

1. Seed of soybean cultivar C405323 having been deposited under ATCC Accession No: 203824.

6,040,503

BEAN-NUT POPPING BEANS

Jeffrey D. Ehlers, Moreno Valley, and Mark H. Sterner, Riverside, both of Calif., assignors to Appropriate Engineering and Manufacturing, Riverside, Calif.

Filed Sep. 2, 1997, Appl. No. 921,490

Int. Cl.[7] **A01H** *5/00;5/10;1/04*

U.S. Cl. 800—313 **33 Claims**

1. A bean plant of the species *Phaseolus vulgaris* which exhibits the phenotypic characteristics of early maturity, bush type growth habit, synchronous fruiting, photoperiod insensitivity, and which produces a bean that pops at a moisture of about 5 to 12 percent.

6,040,504

COTTON PROMOTER

Douglas Rice, Durham; Nadine Carozzi, Raleigh, both of N.C.; David M. Anderson, Altadena, Calif.; Kanniah Rajasekaran, Sierra Madre, Calif.; Thirumale S. Rangan, Pasadena, Calif.; Richard Yenofsky, Arcadia, Calif., and Richard Lotstein, Durham, N.C., assignors to Novartis Finance Corporation, New York, N.Y.

Continuation of application No. 08/218,697, Mar. 28, 1994, which is a continuation of application No. 07/759,969, Sep. 16, 1991, abandoned, which is a continuation of application No. 07/274,452, Nov. 18, 1988, abandoned, which is a continuation-in-part of application No. 07/122,209, Nov. 18, 1987, abandoned. This application Feb. 10, 1998, Appl. No. 21,203.

Int. Cl.[7] **A01H** *5/00;* **C07H** *21/04;* **C12N** *1/21;5/14;15/82*

U.S. Cl. 800—314 **15 Claims**

1. An isolated DNA molecule comprising a nucleic acid fragment having the sequence of:

(a) the approximately 1 kb DNA fragment of genomic clone rbc-gY (ATCC Accession No. 40486) between the XbaI site and the translation start site of the coding region of the cotton small subunit ribulose biphosphate carboxylase gene; or

(b) the approximately 1 kb DNA fragment of genomic clone rbc-gX (ATCC Accession No. 40487) between the PstI site and the translation start site of the coding region of the ribulose biphosphate carboxylase gene.

6,040,505

HYBRID MAIZE PLANT AND SEED 38F70

Hartwig Josef Bernhard Wehrmann, Staufen, Germany, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 6, 1998, Appl. No. 35,960

Int. Cl.[7] **A01H** *5/00;4/00;1/00;* **C12M** *5/04*

U.S. Cl. 800—320.1 **13 Claims**

1. Hybrid maize seed designated 38F70, representative seed of said hybrid 38F70 having been deposited under ATCC accession number PTA-336.

6,040,506

INBRED CORN LINE HX621

Thomas Hoegemeyer, Hooper, Nebr., assignor to Hoegemeyer Hybrid, Hooper, Nebr.

Filed Jan. 6, 1999, Appl. No. 226,011

Int. Cl.[7] **A01H** *5/00;4/00;1/04;5/10;* **C12N** *5/06*

U.S. Cl. 800—320.1 **28 Claims**

1. An inbred corn seed designated HX621, wherein a sample of said seed has been deposited under ATCC Accession No. PTA-968.

6,040,507

INBRED CORN LINE HX622

Thomas Hoegemeyer, Hooper, Nebr., assignor to Hoegemeyer Hybrid, Hooper, Nebr.

Filed Jan. 11, 1999, Appl. No. 227,892

Int. Cl.[7] **A01H** *5/00;5/10;1/04;4/00;* **C12N** *5/04*

U.S. Cl. 800—320.1 **28 Claims**

1. An inbred corn seed designated HX622, wherein a sample of said seed has been deposited under ATCC Accession No. PTA-967.

6,040,508

INBRED CORN PLANT 01HG12 AND SEEDS THEREOF

Michael A. Hall, Sycamore, Ill., assignor to Dekalb Genetics Corporation, DeKalb, Ill.

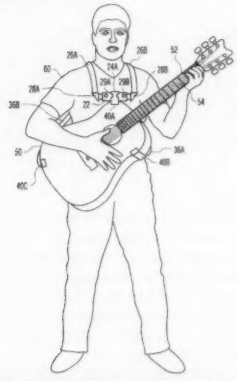
Filed Jan. 14, 1999, Appl. No. 229,522

Int. Cl.[7] **A01H** *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—320.1 **43 Claims**

1. Inbred corn seed of the corn plant 01HGI2, a sample of said seed having been deposited under ATCC Accession No. 203926.

6,040,509
ERGONOMIC POSITIONING APPARATUS FOR GUITAR OR LIKE INSTRUMENTS
Keith Fanella, 40-21 Kuiken Ter., Fair Lawn, N.J. 07410
Filed Mar. 6, 1998, Appl. No. 36,506
Int. Cl.[7] G10D *3/00*
U.S. Cl. 84—280 **20 Claims**



1. An apparatus for the suspension of a string instrument on a body of a player while the player is standing, the string instrument having a main body and a neck extending from said main body, said apparatus comprising:

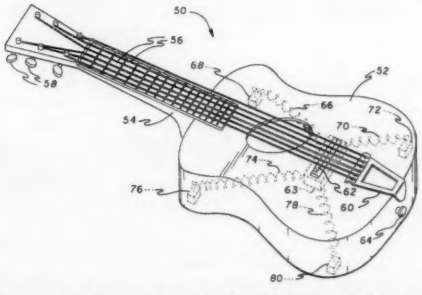
(a) a strap-connector assembly including:

i) a shoulder strap assembly for extending over a person's shoulders, and

ii) first, second and third release connectors secured to said shoulder strap assembly; and

(b) first, second and third attachment devices for attachment at different respective securing positions to said main body of said instrument, each of said attachment devices including a mating connector for connecting to a respective said release connector of said strap-connector assembly, and at least one of said attachment devices including an anchoring device for adjustably attaching the respective attachment device to said main body at any of a plurality of desired locations at the respective securing position such that said string instrument can be set at a desired orientation and angle relative to said player's body.

6,040,510
ACOUSTIC STRINGED INSTRUMENT ENHANCEMENT DEVICE
James S. Yaun, 115 Captain Lowman Rd., Chapin, S.C. 29036
Provisional application No. 60/046,305, May 13, 1997. This application Mar. 16, 1998, Appl. No. 39,183.
Int. Cl.[7] G10D *3/02*
U.S. Cl. 84—294 **13 Claims**



1. In combination: an acoustic stringed instrument enhancement device and a stringed instrument, the stringed instrument including a soundbox having a neck end, a shoulder strap attachment end, an upper sounding board having an inner surface, a lower sounding board having an inner surface, a bridge and a saddle disposed upon the upper sounding board, a sound hole extending through the upper sounding board, and a plurality of strings stretched over the saddle and above the sound hole, and said acoustic enhancement device comprising:

a vibration transmitting block affixed to the inner surface of the upper sounding board directly under and substantially parallel to the saddle;

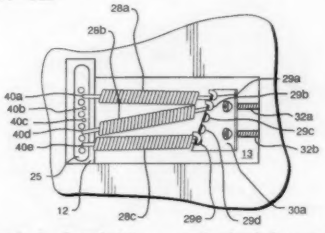
two bottom blocks affixed in spaced opposition on the inner surface of the lower sounding board at the neck end of the soundbox;

a first tensioned spring having an upper end removably attached to said vibration transmitting block, and having a lower end removably attached to one of said bottom blocks;

a second tensioned spring having an upper end removably attached to said vibration transmitting block, and having a lower end removably attached to the other of said bottom blocks; and,

wherein the two tensioned springs are disposed within the soundbox in a V-shaped configuration.

6,040,511
METHOD OF OPTIMIZING A GUITAR TREMOLO
Brian W. Hall, 52 Ann's La., Hampton, N.H. 03842
Filed Jan. 11, 1999, Appl. No. 228,912
Int. Cl.[7] G10D *3/00*
U.S. Cl. 84—313 **8 Claims**



1. A method of optimizing a spring-loaded tremolo device including a base plate having a bridge fulcrum, a block and a plurality of tremolo device tension springs biasing said tremolo device in an at rest position, said method substantially balancing uneven stresses applied to a stringed instrument system, such as a guitar, caused by differing instrument string tensions applied by a plurality of string tension tuners, said method comprising the steps of:

asymmetrically loading said tremolo device to counteract said uneven stresses applied to the instrument by said differing string tensions;

ensuring that said bridge fulcrum is substantially free to rotate;

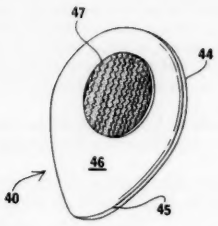
tuning said instrument to pitch by adjusting said instrument string tension using said string tension tuners;

cycling said tremolo device to stretch said tremolo tension springs to their maximum available length of travel and to return said tension springs back to a neutral position; and

re-tuning said instrument by adjusting said tremolo spring tension until instrument strings at opposite edges of said tremolo device provide their proper pitches.

6,040,512
GUITAR PICK WITH HOOK AND LOOP CLOSURE MATERIAL
Zackery Polley, 5671 Miles Ave., #D, Oakland, Calif. 94618
Filed Jun. 18, 1998, Appl. No. 99,478
Int. Cl.[7] G10D *3/16*
U.S. Cl. 84—322 **6 Claims**

1. A guitar pick, for use in playing a stringed instrument such as a guitar having a guitar body, comprising:



a gripping portion;

a picking portion, the gripping portion and pick portion having an overall teardrop shape, substantially thin and having two sides; and

hook closure material mounted on the gripping portion on one of the sides.

6,040,513

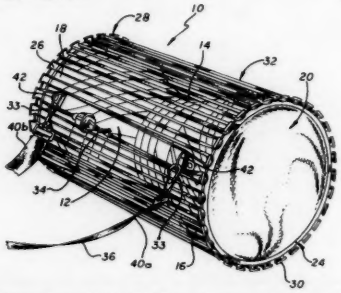
DRUM COUNTERHOOP

Remo D. Belli, Valencia, Calif., assignor to Remo, Inc., Valencia, Calif.

Filed Mar. 24, 1997, Appl. No. 823,357

Int. Cl.[7] G10D *13/02*

U.S. Cl. 84—411 R **2 Claims**



1. A drum for emitting different tones and pitches having in combination, a drum shell, a drum head attached to each end of the drumshell, first and second counterhoops, said first counterhoop for fitting over one of said drumheads and said second counterhoop for fitting over said other drum head, and each of said counterhoops provided with a plurality of spaced-apart arm members projecting from said first and second counterhoops, each of said arm members being T-shaped to prevent a cord in threaded engagement therewith from slipping off said arm member inadvertently and provided for receiving said cord in said threaded engagement back and forth with relative speed between the arm members and each of said counterhoops forming taut cord strands in generally parallel relation to each other around and spaced apart from the drumshell, to enable two or more of said cord strands to be squeezed or pressed together when the drumhead is struck to produce changes in the tones and pitches of the sounds emanating from the drum.

6,040,514

LEGLESS CONGA DRUM STAND FOR USE WHILE SITTING OR KNEELING

Tsun-Chi Liao, Taichung, Taiwan, assignor to HWA Shin Musical Instrument Co., Ltd., Taichung, Taiwan

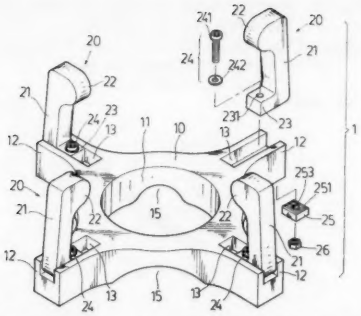
Filed May 6, 1998, Appl. No. 72,684

Int. Cl.[7] G10D *13/02*

U.S. Cl. 84—421 **4 Claims**

1. A type of structural improvement of conga drum stand, said conga drum stand comprises mainly:

a carrier, being shaped as a ring frame, at its center being a round hole, extending radially from the rim of said carrier



being the formation of several balancing blocks, on top of each of said balancing blocks being an open trough, and on the bottom of each of the balancing blocks being recessed upward a long channel to correspond the positions of said open troughs; on the bottom side of said open trough being a long hole that communicates to said long channel; on the wall of said round hole and between every two balancing blocks being an arched sound escape arc;

a same number of positioning blocks as said open troughs with the same width as the open troughs, each of said positioning blocks having an erected block body, the top of said block body projecting sideways to form a block end, the bottom of said block body projecting toward the same side as said block end being the formation of a block base; running vertically on said block base being a locking hole; the block bases of said positioning blocks being installed in said open troughs, said locking hole being penetrated by a locking component through said long hole, its bottom end extending to the long channel and being tightened by a hexagonal nut to fix said positioning block;

so configured that each positioning block may be moved freely inside said open trough.

6,040,515

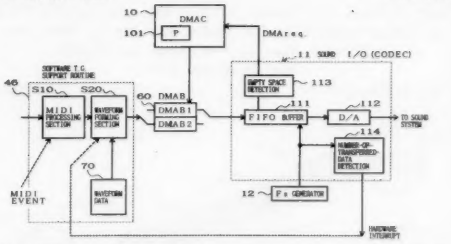
METHOD AND DEVICE FOR GENERATING A TONE

Masahiro Mukojima, and Ryo Kamiya, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Division of application No. 08/770,357, Dec. 20, 1996, Pat. No. 5,973,251. This application Sep. 2, 1999, Appl. No. 388,987. Claims priority, application Japan, Dec. 21, 1995, 7-349046

Int. Cl.[7] G10H *7/00*

U.S. Cl. 84—603 **3 Claims**



1. A tone generating device for generating a tone waveform by executing predetermined software via a processing unit, said processing unit including a processor for executing the predetermined software, a buffer memory, a digital-to-analog converter and a counter,

said processing unit generating the tone waveform by, on the basis of the predetermined software, performing:

a first step of, upon reception of performance information, generating tone-generation control information corresponding to the performance information;

a second step of generating a plurality of waveform samples on the basis of the tone-generation control information and storing the generated waveform samples into said buffer memory;

a third step of sending one of the waveform samples stored in said buffer memory to said digital-to-analog converter, every sampling cycle;

a fourth step of, via said counter, counting a number of the waveform samples sent to said digital-to-analog converter, every sampling cycle; and

a fifth step of generating a start signal for activating said second step each time it is detected on the basis of a counted value of said counter that a predetermined number of the waveform samples have been sent to said digital-to-analog converter.

6,040,516

TONE GENERATION SYSTEM USING COMPUTER SOFTWARE AND STORAGE MEDIUM STORING THE COMPUTER SOFTWARE

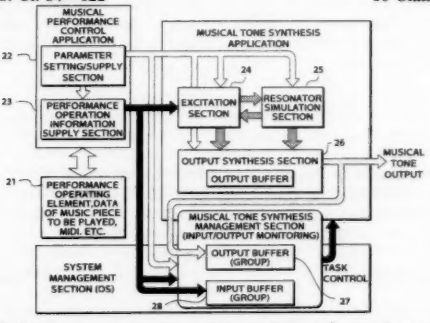
Hideyuki Masuda, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 30, 1999, Appl. No. 281,167

Claims priority, application Japan, Mar. 31, 1998, 10-103946

Int. Cl.[7] **G10H** *1/08*

U.S. Cl. 84—622 **10 Claims**



1. A tone generator system using computer software, the computer software comprising:

a musical tone synthesis module for generating a musical tone signal by generating an excitation signal in response to an request for generating said excitation signal and at least delaying and looping the generated excitation signal;

a first monitoring module for monitoring whether or not said request for generating said excitation signal is issued;

a second monitoring module for monitoring whether or not said musical tone signal is generated by said musical tone synthesis module; and

an interruption module for interrupting execution of said musical tone synthesis module when said first monitoring module detects that said request for generating said excitation signal is not issued, and at the same time said second monitoring module detects that said musical tone signal is not generated.

6,040,517

RHYTHMIC TONE GENERATOR

Yoshiaki Sakamoto, Tokyo, Japan, assignor to RIC Company, Ltd., Japan

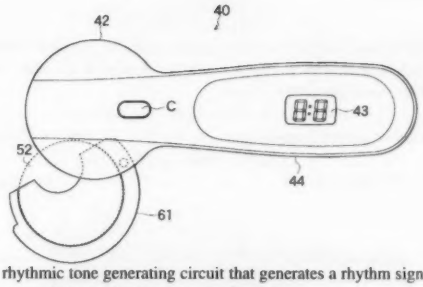
Filed Jun. 3, 1999, Appl. No. 325,440

Claims priority, application Japan, Jun. 4, 1998, 10-170554; Mar. 3, 1999, 11-099192

Int. Cl.[7] **G10H** *1/40*

U.S. Cl. 84—713 **20 Claims**

1. A rhythmic tone generator adapted to be attached to an ear of a user, comprising:



a rhythmic tone generating circuit that generates a rhythm signal comprising a plurality of sets of pulses;

a battery that supplies electric power to said rhythm tone generating circuit;

a tone generating device that is driven by the rhythm signal to generate tones;

a casing that houses said rhythm tone generating circuit, said battery, and said tone generating device; and

an attaching device that attaches said casing to a concha of the user so that said casing is located on the concha;

wherein the rhythmic tone generator is attached to the ear without being inserted into an ear hole, so as to generate the rhythmic tones in the vicinity of the ear hole.

6,040,518

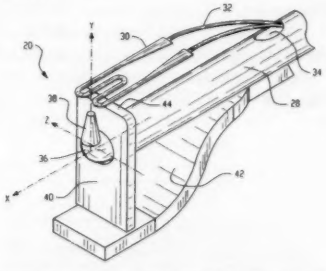
WAFER TEMPERATURE MONITORING DEVICE UTILIZING FLEXIBLE THERMOCOUPLE

David W. Kinnard, Olney, Md., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 22, 1998, Appl. No. 218,912

Int. Cl.[7] **H01L** *35/34*

U.S. Cl. 136—201 **20 Claims**



1. A thermocouple support arm assembly (**20**), comprising:

an arm (**28**) extending longitudinally along a first axis (X) and having a thermocouple (**30**) extending therefrom;

an anvil (**40**) supported by said arm (**28**) and at least partially occupying a plane defined by a second axis (Y) and a third axis (Z), said anvil positioned below said thermocouple; and

a mounting mechanism (**36**) for mounting said anvil (**40**) on said arm (**28**) such that said anvil (**40**) is permitted three degrees of rotational freedom with respect to said arm along, respectively, axes X, Y and Z;

wherein when a substrate is positioned above said thermocouple (**30**) to at least partially rest upon said thermocouple and said anvil (**40**), said anvil moves with respect to said arm (**28**) along said axes (X, Y, Z) to force said thermocouple into contact with said substrate.

6,040,519

UNIT SHEATH

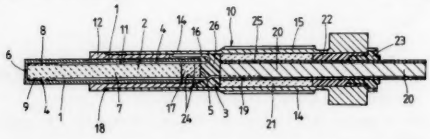
Hideki Kita, and Hideo Kawamura, both of Kanagawa-ken, Japan, assignors to Isuzu Ceramics Research Institute Co., Ltd., Kanagawa-ken, Japan

Filed Oct. 6, 1998, Appl. No. 166,564

Claims priority, application Japan, Nov. 21, 1997, 9-336546

Int. Cl.[7] H01L *35/02*

U.S. Cl. 136—230 **11 Claims**



1. A unit sheath comprising a protective envelope of ceramics high in density, the envelope being opened at its one end and closed at its opposing end, a metallic filament of any one of pure tungsten, molybdenum and alloy thereof received in the envelope, a high-density sealant of any one of glass and heat resisting synthetic resin for hermetically closing the envelope at the opened end, and a filler of non-conductive, unburned material packed in the space around the metallic filament in the envelope, the filler containing therein an additive that may be subjected to the oxidation at the temperature lower than that of the metallic filament, resulting in the deoxidation in the envelope.

6,040,520

SOLAR CELL AND METHOD OF MANUFACTURING THE SAME

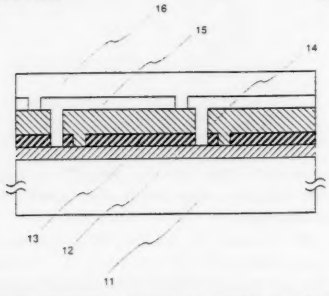
Hisao Morooka, Yamanashi; Takamitsu Miura, Kanagawa; Hiroshi Yamada, Yamanashi; Katsuki Kurihara, Yamanashi; Mitsutaka Matsuse, Yamanashi, and Yasuyuki Arai, Kanagawa, all of Japan, assignors to Semicondutor Energy Laboratory Co., Ltd., Kanagawa, and TDK Corporation, Tokyo, both of Japan

Filed Apr. 22, 1998, Appl. No. 64,175

Claims priority, application Japan, May 16, 1997, 9-143078

Int. Cl.[7] H01L *31/045;31/0392*

U.S. Cl. 136—245 **21 Claims**



7. A solar cell comprising a flexible substrate and a photoelectric conversion layer disposed over the flexible substrate and constituted by a laminated layer of thin films comprising non-single crystalline silicon,

wherein the flexible substrate is made of an alloy comprising iron and nickel,

wherein the flexible substrate has a coefficient of linear thermal expansion of 2.0 ppm/° C. to 10.0 ppm/° C., and

wherein a nickel content of the alloy is 30 wt % to 51 wt %.

6,040,521

N-TYPE WINDOW LAYER FOR A THIN FILM SOLAR CELL AND METHOD OF MAKING

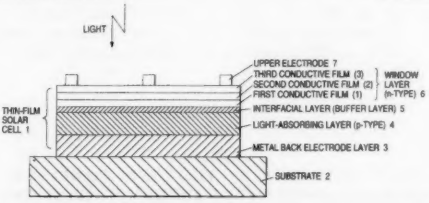
Katsumi Kushiya; Daisuke Okumura, and Ichiro Sugiyama, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

Filed May 9, 1997, Appl. No. 854,092

Claims priority, application Japan, Nov. 8, 1996, 8-311182

Int. Cl.[7] H01L *31/032;31/0272*

U.S. Cl. 136—265 **6 Claims**



1. A thin-film solar cell comprising a metal back electrode layer having formed thereon in this order a p-type CIGS light absorbing layer, an interfacial layer, an n-type window layer, and an upper electrode, wherein the n-type window layer comprises transparent conductive films which have a stacked structure comprising a first transparent conductive film formed on the interfacial layer and serving as an interface-protective film, a second transparent conductive film formed on the first transparent conductive film, and a third transparent conductive film formed on the second transparent conductive film.

6,040,522

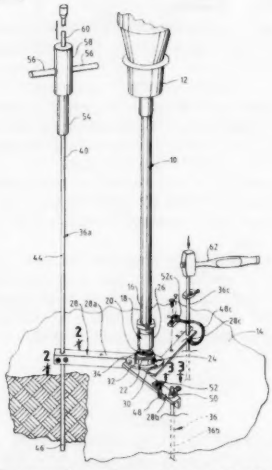
ELECTRICALLY GROUNDED LAND SURFACE MOUNTING FOR ELECTRICAL EQUIPMENT

William C. Beggs, 4110 Shawanee La., NE., Atlanta, Ga. 30319

Filed Apr. 16, 1998, Appl. No. 61,554

Int. Cl.[7] H01R *4/66*

U.S. Cl. 174—7 **16 Claims**



1. A base for mounting and grounding an electrical fixture in an earthen site comprising

at least one collar member having a first end adapted to receive support means for an electrical fixture,

a flange member engaging the collar member and supporting the first end of the collar member in an upright position,

at least one elongated ground rod dowel member having a first end portion, a body portion and a second end portion,

the first end portion being joined to the collar member by the flange member, and

the second end portion and the body portion being positioned deeply within the earth at the site for transmitting and discharging electrical charges from the fixture and support means into the earth.

6,040,523

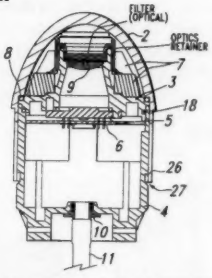
SNAP-FIT DESIGN OF AN AIRBORNE MISSILE SYSTEMS SEEKER/DETECTOR SECTION USING ENGINEERING PLASTICS

Robert J. Cunningham, Plano, Tex., assignor to Raytheon Company, Lexington, Mass.

Provisional application No. 60/032,822, Dec. 11, 1996, abandoned. This application Dec. 1, 1997, Appl. No. 982,554.

Int. Cl.[7] H05K *9/00*

U.S. Cl. 174—35 R **17 Claims**



1. A detector/seeker assembly which comprises:

an electrically conductive molded plastic two-piece housing including a relatively rigid electrically conductive first housing portion having a groove and a second housing portion having a sidewall extending over and adjacent said first housing portion, said second housing portion having a plurality of relatively flexible tab portions, a part of each of said tab portions extending into said groove and making mechanical contact with said first housing portion via said groove to provide a press fit therebetween;

an electrically conductive member disposed within said housing and electrically connected to said first housing portion to form an electrically shielded first chamber within said housing for containing equipment to be shielded from electromagnetic radiations therein and a second chamber for containing optics therein; and

a second groove disposed in at least one of said member and said first housing portion and an electrically conductive o-ring disposed in said second groove and contacting said member and said first housing portion to provide an electrically conductive path between said member and said first housing portion.

6,040,524

PRINTED CIRCUIT BOARD HAVING TWO HOLES CONNECTING FIRST AND SECOND GROUND AREAS

Yuji Kobayashi, and Shinichiro Yamashita, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1995, Appl. No. 568,317

Claims priority, application Japan, Dec. 7, 1994, 6-303886

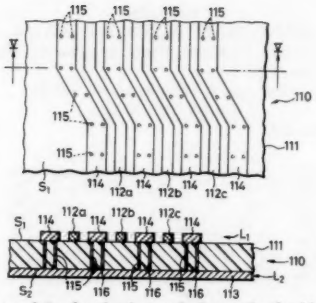
Int. Cl.[7] H01B *7/34*

U.S. Cl. 174—36 **25 Claims**

1. In a printed circuit board, the combination of:

at least a first dielectric lamina having opposed surfaces;

a first layer deposited on one of said surfaces and comprised of a plurality of first layer signal lines on said one of said surfaces connected to a signal source, and a plurality of first ground areas of a defined width connected to ground arranged between said first layer signal lines on said one of said



surfaces of the first lamina such that each of said first layer signal lines has one of said first ground areas on a side thereof so that each of said first layer signal lines is not immediately adjacent to another of said first layer signal lines;

a second substantially uninterrupted layer on the other of said surfaces of the first lamina and constituting a second ground area connected to ground which is substantially coextensive with said other of said surfaces;

at least two holes extending through said first lamina between one of said first ground areas and said second ground area and each of said holes having openings at one of said first ground areas and at said second ground area; and

conductive means in said holes electrically connecting said first and second ground areas for shielding said first layer signal lines on said one of said surfaces from each other and wherein the separation between said holes extending between one of said first ground areas and said second ground area is less than the width of said one of said first ground areas.

6,040,525

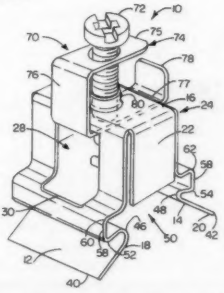
ELECTRICAL CLIP AND METHOD

Jacques Chauquet, Ayse-Bonneville, and Jean Claude Fuchs, L'Etrat, both of France, assignors to Erico International Corporation, Solon, Ohio

Provisional application No. 60/015,613, Apr. 18, 1996. This application Apr. 14, 1997, Appl. No. 843,223.

Int. Cl.[7] H02G *7/00*

U.S. Cl. 174—40 CC **18 Claims**



1. An electrical spring steel clip for attaching an electrical conductor to a bus bar having a face and opposed edges comprising a housing having at least one window through which said conductor is inserted transversely of said bus bar, said housing having two spring legs shaped to embrace and snap around both edges of said bus bar, said housing being open to said face of the bus bar, and means on said housing to clamp a conductor inserted through said window against said face of the bus bar.

6,040,526

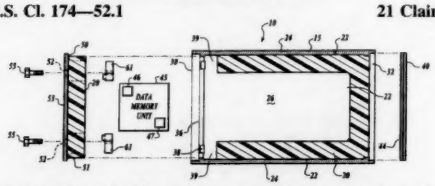
ACCESS PANEL RETENTION DEVICE

Richard A. Olzak, Kirkland, Wash., assignor to AlliedSignal, Morristown, N.J.

Filed Apr. 2, 1998, Appl. No. 54,168

Int. Cl.[7] H05K *5/06*

U.S. Cl. 174—52.1 **21 Claims**



1. A crash-survivable enclosure assembly for protecting a data memory unit used in vehicles, the crash-survivable enclosure assembly comprising:

an enclosure having an access opening and an inner enclosure surface;

a fixed position access panel support element extending inwardly from the inner enclosure surface, the support element having inner and outer support surfaces;

an access panel, having a panel inner surface, removably positioned against the outer support surface of the support element, the inner enclosure surface and the access panel inner surface defining an inner cavity; and

a retention device comprising:

a mechanical member having a main surface mounted against the inner support surface of the support element;

a fulcrum extending from the main surface and engaging the access panel inner surface; and

a fastener element biasing the mechanical member and the access panel towards one another so the fulcrum presses against the panel inner surface and the support element is captured between the access panel and the mechanical member.

6,040,527

CABLE JOINT WITH GROUNDING CONNECTION AND/OR SCREEN CROSS-BONDING FOR POWER CABLES

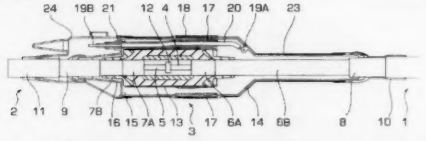
Jo De Buyst, Aalst, and Jozef Renier Catharina Cardinaels, Wetteren, both of Belgium, assignors to Alcatel, Paris, France

Filed Nov. 18, 1998, Appl. No. 195,436

Claims priority, application European Pat. Off., Nov. 28, 1997, 97402882

Int. Cl.[7] H01R *4/00*

U.S. Cl. 174—88 C **10 Claims**



1. A cable joint for connecting power cables, each cable having a terminus and having a conductor having bared portions successively surrounded by a first insulation layer, a semi-conductive layer, a metallic screen, and a second insulation layer,

said cable joint including a junction body having a first end and a second end, said junction body comprising:

connection means for connecting said bared portions of the conductors together at the terminus of each cable and first insulation means for surrounding said connection means,

said cable joint further including:

a metallic member having an inner and an outer side forming a shield over the junction body, and second insulation means covering said metallic member as well as end portions of the second insulation layer of the power cables,

said metallic member having at least two parts electrically separated by a shield break and each of the parts provided with a terminal electrically coupled to the metallic screen of each of said power cables,

wherein at least one of said terminals is an internal terminal located at the inner side of said metallic member and is connected to a first end of an insulated conductor located inside said metallic member and having a second end of the insulated conductor which extends outside said metallic member.

6,040,528

INSULATING SUPPORTING STRUCTURE FOR HIGH-VOLTAGE APPARATUS INCLUDING INORGANIC INSULATING LAYER FORMED ON A SURFACE OF AN ORGANIC INSULATING STRUCTURE

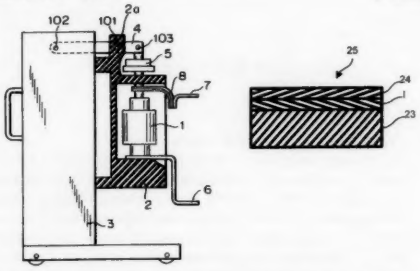
Tadao Kitamura, and Hisaji Shinohara, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 17, 1994, Appl. No. 324,396

Claims priority, application Japan, Oct. 18, 1993, 5-259503

Int. Cl.[7] H01B *17/00*

U.S. Cl. 174—138 C **8 Claims**



1. An electrically insulating supporting structure for a high voltage electric apparatus having a high voltage charging part and a ground potential part, the structure being adapted to be disposed between the high voltage charging part and the ground potential part, the structure comprising:

an organic insulating structure formed in a predetermined shape;

an inorganic insulating layer comprising a layer coated on a surface of the organic insulating structure; and

an intermediate layer containing a mixture consisting essentially of organic powder and inorganic powder and located between the insulating layer and the organic insulating structure.

6,040,529

FLEXIBLE SUBSTRATE

Naoki Takeshita; Manabu Kusano; Fumihiko Sagawa, all of Fukushima-ken, and Taizo Nakagawa, Fukuhisma-ken, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

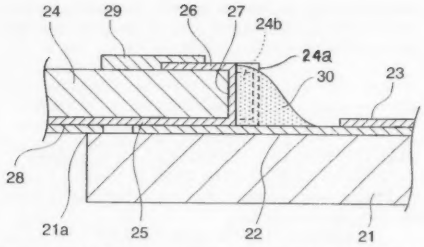
Filed Feb. 18, 1998, Appl. No. 25,598

Claims priority, application Japan, Feb. 19, 1997, 9-0521039

Int. Cl.[7] H05K *1/00*

U.S. Cl. 174—254 **4 Claims**

3. A flexible substrate wherein a conductor pattern for connection is formed on one side thereof so as to be opposed to a conductor pattern provided on a printed circuit board, wherein an island-like conductor pattern is formed on the other side of said flexible substrate in correspondence with said flexible substrate conductor pattern for connection, wherein said flexible substrate conductor pattern and said island-like conductor pattern are connected to each other through an electrode provided on an end



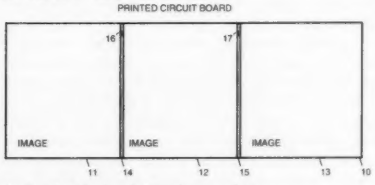
surface of said flexible substrate, and wherein said electrode is being connected to the conductor pattern of said printed circuit board.

6,040,530

VERSATILE PRINTED CIRCUIT BOARD FOR TESTING PROCESSING RELIABILITY

Robert J. Wharton, Rocklin; Eric R. Daniel, Sacramento, and Joseph D. Brown, Rocklin, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 5, 1997, Appl. No. 986,078
Int. Cl.[7] H01R *9/09*
U.S. Cl. 174—261 **21 Claims**



1. A printed circuit board comprising:

a first image, the first image comprising:

a first array pattern for attaching a package,

a first power plane, and

a first ground plane;

a second image, the second image comprising:

a second array pattern for attaching a package,

a second power plane, and

a second ground plane;

a first routing area between the first image and the second image, the first routing area electrically and physically isolating the first power plane from the second power plane, the first routing area also physically isolating the first ground plane from the second ground plane; and,

a first single trace extending through the first routing area, the first single trace electrically connecting the first ground plane to the second ground plane.

6,040,531

PROCESS FOR CONTROLLING BODY WEIGHT

Karen Miller-Kovach, Centerport, N.Y.; Sarah May Watson, Camberley; Marian Jane Way, Fareham, both of United Kingdom; Wanema Frye, Overland Park, Kans.; Mary Grace Melnyk, Astoria, and Adrienne Forman, Great Neck, both of N.Y., assignors to Weight Watchers (UK) Limited, United Kingdom

Continuation-in-part of application No. PCT/US96/17511, Nov. 1, 1996. This application Jul. 18, 1997, Appl. No. 896,855.

Claims priority, application United Kingdom, Nov. 1, 1995, 9522364

Int. Cl.[7] G06F *15/02*
U.S. Cl. 177—25.16 **17 Claims**

17. A process for weight control comprising the steps of:

storing data in a computer memory from which can be obtained a numerical whole number point value for each of a variety of food servings based on the calories, fat and dietary fiber content of the serving wherein each numerical point value is based on a predetermined fraction of the energy content of the food serving increased on the basis of fat content and decreased on the basis of fiber content;

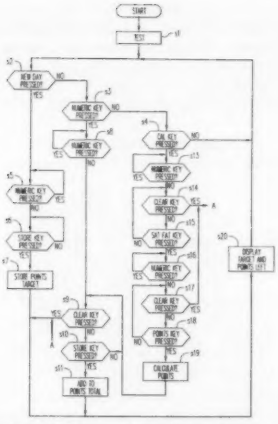
obtaining said numerical whole number point value for candidate food servings for a day's menu;

determining a minimum and maximum whole number numerical daily point total appropriate to produce a restricted daily energy intake based on the current weight of the individual;

calculating the sum of the numerical point values for said candidate food servings;

determining whether the calculated sum lies within the determined minimum and maximum; and

ingesting the food servings corresponding to a total lying within said determined minimum and maximum.

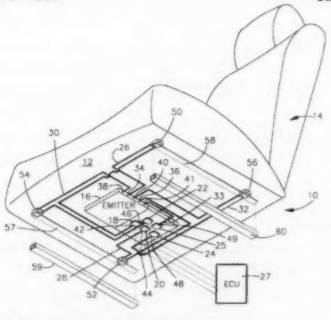


6,040,532

VEHICLE OCCUPANT WEIGHT SENSOR

Carl A. Munch, Troy, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Oct. 26, 1998, Appl. No. 178,945
Int. Cl.[7] G01G *19/52*
U.S. Cl. 177—144 **18 Claims**



1. A vehicle seat weight sensor comprising:

a light source for providing a predetermined amount of light;

a light detector for detecting light from said light source and providing a signal indicative thereof;

a member for mounting to a vehicle seat and impeding passage of light between said light source and said light detector according to a load applied to the vehicle seat; and

an electronic control device coupled to said light detector for determining, in response to said light detector signal, a weight value according to the load applied to the vehicle seat.

6,040,533

SWITCH ARRANGEMENT FOR A VEHICLE SEAT

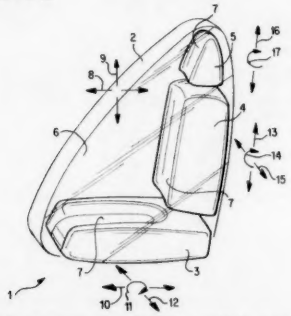
Peer-Oliver Wagner, Biebertal, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Jul. 13, 1998, Appl. No. 114,189

Claims priority, application Germany, Jul. 11, 1997, 197 29 866

Int. Cl.[7] H01H *9/26*

U.S. Cl. 200—5 A **14 Claims**



1. A switch arrangement adjusting a vehicle seat in a vehicle, comprising:

a plurality of individual switch bodies, each having a shape which corresponds to a shape of a respective important element of the vehicle seat and being manipulatable to produce a corresponding relative movement of the respective element of the vehicle seat; and

an operating part in addition to the switch bodies, which operating part is manipulatable to produce a corresponding movement of the entire vehicle seat;

wherein said switch bodies for adjusting respective elements of the vehicle seat are mounted on the operating part.

6,040,534

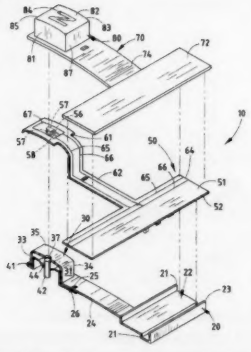
INTEGRALLY MOLDED SWITCH LIGHTING AND ELECTRONICS

Jack A. Beukema, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Oct. 13, 1998, Appl. No. 170,736

Int. Cl.[7] H01H *13/70;9/18*

U.S. Cl. 200—5 A **13 Claims**



1. An integrated electrical control assembly comprising:

a polymeric cover including a graphic element formed thereon;

a flex circuit including an electroluminescent panel, said panel positioned within said cover to be aligned with said graphic element; and

a substrate sandwiching said flex circuit to said cover, wherein said substrate includes a first section of a rigid polymeric material and a second section including a carbon-filled elastomeric material and wherein said flex circuit includes switch contacts aligned with a switch actuator formed in said elastomeric material to define a switch.

6,040,535

STARTER SWITCH, IN PARTICULAR IGNITION STARTER SWITCH FOR MOTOR VEHICLE

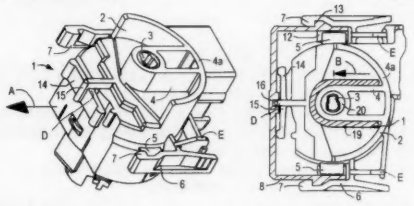
Robert Thalhammer, Iffeldorf, Germany, assignor to Merit-Malta Ltd., Mriehel, Malta

Filed Jan. 5, 1998, Appl. No. 2,767

Claims priority, application Germany, Jan. 8, 1997, 197 00 358

Int. Cl.[7] B60R *25/02*

U.S. Cl. 200—43.08 **10 Claims**



1. A starter switch formed as an ignition starter switch for a motor vehicle, comprising a starter switch housing; a rotor having a coupling for receiving a rotatable drive pin of a lock cylinder of a steering lock; a steering lock housing provided on the motor vehicle; means for releasably mounting the starter switch on the steering lock housing; guiding means for supporting the starter switch on the steering lock housing for displacement transversely to an axial direction of the lock cylinder, said guiding means being formed as guiding shoulders provided on said starter switch housing and extending transversely to the axial direction of the lock cylinder so as to be engaged by guiding webs of the steering lock housing, said guiding shoulders together with the guiding webs forming an abutment against an axial withdrawal of the starter switch from the steering lock housing, said starter switch housing being provided with arresting means for fixing the starter switch housing on the steering lock housing against a radial withdrawal.

6,040,536

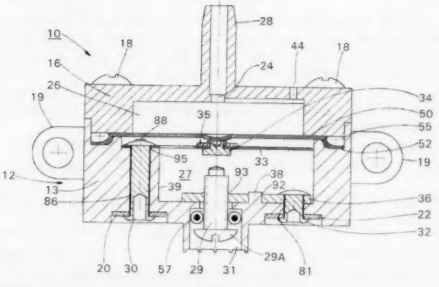
PRESSURE RESPONSIVE SWITCH AND METHOD OF MAKING SAME

Bearge Miller; Norman K. Miller, both of Glen Mills; Gevork Sarkisian, Philadelphia; Karen Sarkissian, Philadelphia, and Anatoly Galperin, Philadelphia, all of Pa., assignors to Miller Edge, Inc., Jennersville, Pa.

Filed Jan. 26, 1998, Appl. No. 12,993

Int. Cl.[7] H01H *35/34*

U.S. Cl. 200—83 N **2 Claims**



1. A pressure responsive switch comprising:

a) a housing base with an open side;

b a housing cover that communicates with the open side of the housing base to form a fluid-tight housing;

c) first and second electrically-conductive terminals passing through said housing;

d) an adjustable contact for adjusting the sensitivity of the switch, the adjustable contact being electrically connected to said first terminal;

e) a pressure responsive member disposed within the housing, the pressure responsive member communicating with the housing to define first and second chambers wherein at least a portion of said pressure responsive member is deflectable in response to a change in pressure within either of said chambers;

f) means that communicate with said housing for applying an operative pressure within at least one of said chambers; and

g) a spring-contact assembly disposed within said housing and electrically connected to the second electrically-conductive terminal, said spring-contact assembly being positioned to have at least a portion of the spring-contact assembly be carried by the deflectable portion of the pressure responsive member into contact with said adjustable contact during said change in pressure within one of said chambers, thereby making an electrical connection between the first terminal and the second terminal wherein said spring-contact assembly comprises an elongated flexible member that extends radially inwards from an annular metallic member, said annular metallic member being secured to said housing.

6,040,537

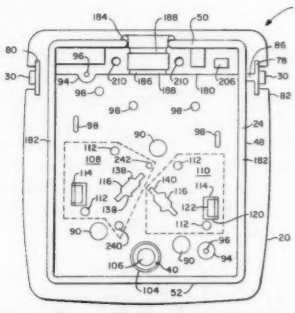
FOOT OPERATED CONTROL UNIT

Larry E. McClintock, Putnam, Conn., assignor to Linemaster Switch Corporation, Woodstock, Conn.

Filed Apr. 30, 1997, Appl. No. 846,736

Int. Cl.[7] **H01H** *21/26*

U.S. Cl. 200—86.5 **19 Claims**



16. A foot operated control unit for controlling a power circuit of an associated power driven device, the control unit comprising:

at least one control mechanism connectable with the power circuit for controlling the operation thereof, the control mechanism comprising a first switch having a body and a switch actuator biased outwardly from the switch body;

lever means for actuating the control mechanism comprising a first lever having an actuator portion engageable with the switch actuator and an arm extending laterally and upwardly from the actuator portion;

a base adapted to be placed on a supporting surface, the base having a base plate defining at least one mounting station comprising a mounting bracket, positioning pin means extending upwardly from the base plate for mounting the control mechanism, and mounting means for pivotally mounting the lever means to the base plate;

a foot operated cover mounted to the base and pivotally moveable between a non-actuating position and at least one actuating position, the cover having a first actuator peg extending downwardly from an interior surface, the first actuator peg being engageable with the arm of the first lever; and

spring means engaged with the base and the cover for biasing the cover to the non-actuating position, the spring means comprising a first spring;

wherein the first switch is actuated by pushing the cover to a first actuating position against the bias of the first spring, wherein the first actuator peg engages the arm of the first lever and pushes the arm down, the first lever pivots, engaging the actuator portion with the switch actuator and actuating the first switch.

6,040,538

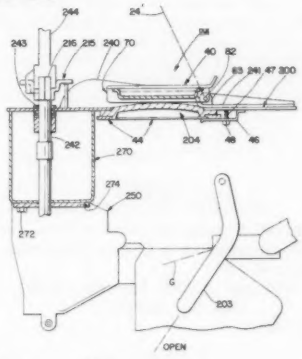
SWITCHGEAR ASSEMBLY

Thomas G. French, Chicago; Raphael H. Guio, Palatine; Henry W. Kowalyshen, Niles; Buddy B. McGlone, Lombard; Gregory C. Mears, and John C. Opfer, both of Chicago, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Division of application No. 08/705,460, Aug. 29, 1996, Pat. No. 5,864,107, which is a continuation-in-part of application No. 08/653,176, May 24, 1996, abandoned. This application Dec. 14, 1998, Appl. No. 210,704.

Int. Cl.[7] **H01H** *9/00;* **H02B** *13/00*

U.S. Cl. 200—293 **21 Claims**



9. Switchgear comprising:

a housing having an exterior and enclosing electrical components;

a first array of viewing provisions for viewing predetermined interior portions of said housing;

a second array of operating controls for operating one or more of said electrical components;

a third array of display panels, each of said display panels being generally planar and located on said exterior of said housing and movably mounted about a first edge of said display panel and with respect to said housing and covering said viewing provisions when said display panels are in a predetermined position, said display panels comprising means for displaying representations of said electrical components and the energized/deenergized status of said electrical components; and

electrical interconnection means for providing electrical interconnection from one or more of said electrical components to the exterior of said housing, said first array of viewing provisions of said second array of operating controls being generally provided along a first surface area of said housing, and said electrical interconnection means being provided generally along a second surface area of said housing, said first and second surface areas generally defining a predetermined angle therebetween.

6,040,539

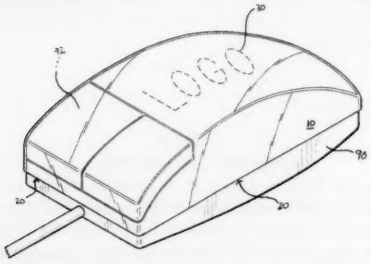
PROTECTIVE COVER FOR A COMPUTER MOUSE

Todd N. Hiegel, 403 Lake Cliff Dr., Erie, Pa. 16511

Provisional application No. 60/070,794, Jan. 8, 1998. This application Jan. 6, 1999, Appl. No. 225,514.

Int. Cl.[7] H01H *9/04;* **G06K** *11/18*

U.S. Cl. 200—302.1 **8 Claims**



1. In combination with a computer mouse having a top, a bottom, and sides, a cover comprising:

a flexible, elastic material having smaller dimensions than said mouse that when stretched covers the entire top of said computer mouse and a portion of each side of said computer mouse such that said cover is secured to said mouse by the tension of said material against said sides of said mouse caused by the stretching of said material into position such that said material snugly fits and conforms to the contour of said mouse, whereby said top of said mouse is protected from potential contaminants, and said bottom of said mouse is left free for proper use.

6,040,540

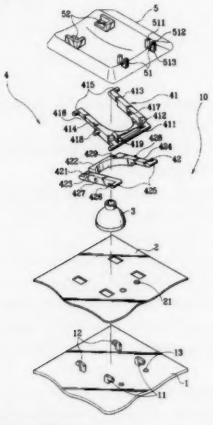
KEYSWITCH STRUCTURE

Ching Cheng Tsai, Keelung, and Wen To Chou, Taipei Hsien, both of Taiwan, assignors to Chicony Electronics Co., Ltd., Taipei Hsien, Taiwan

Filed Jan. 13, 1999, Appl. No. 229,557

Int. Cl.[7] H01H *13/70*

U.S. Cl. 200—344 **8 Claims**



1. A key switch comprising:

a base plate member having a lower pivot groove formed therein;

a conductive membrane fixedly mounted on said base plate member;

an elastic member;

a key having an upper pivot groove and a pivot recess formed therein;

a key support mechanism having first and second support levers, said first and second support levers being centrally pivotally mounted each to the other and having identical U-shaped structural contours, said first support lever forming first and second vertical shafts and having a first pivot shaft slidably mounted within said upper pivot groove of said key and having a first lateral shaft pivotally mounted within said lower pivot groove of said base plate member, said second support lever forming a third and a fourth vertical shaft and having a second pivot shaft pivotally secured within said pivot recess of said key, said pivot recess containing at least one-half of the length of said second pivot shaft, said pivot recess forming first and second walls, said first and second walls being contiguous with said second pivot shaft, said first wall having a hook formed thereon, said hook having a length greater than a radius of said second pivot shaft, said second wall having a thickness less than that of said first wall to allow for structural flexibility, said second support lever having a second lateral shaft in slidable electrical contact with said conductive member.

6,040,541

KEY SWITCH

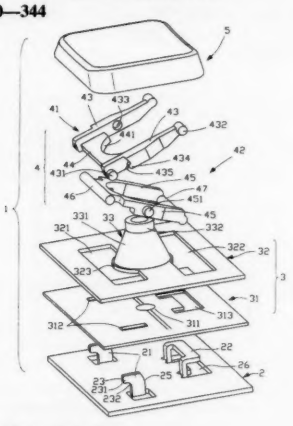
Yu-Chieh Li, Taipei, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed May 4, 1999, Appl. No. 305,686

Claims priority, application Taiwan, Jun. 25, 1998, 87210199

Int. Cl.[7] H01H *13/70*

U.S. Cl. 200—344 **10 Claims**



1. A key switch, comprising:

a key cap;

a base having a first engaging means and a second engaging means each upwardly extending therefrom, the first engaging means comprising a first side distal from the second engaging means and a second side proximate the second engaging means;

a support linkage pivotably interconnected between the key cap and the base, consisting of a first link and a second link, the first link comprising a pair of arms, each of the arms having an engaging pin abutting against the first side of the first engaging means and an extension abutting against the second side of the first engaging means for pivotably engaging the first link to the base; and

a circuit board assembly disposed above the base and responsive to a downward movement of the key cap to indicate a depression of the key cap.

6,040,542

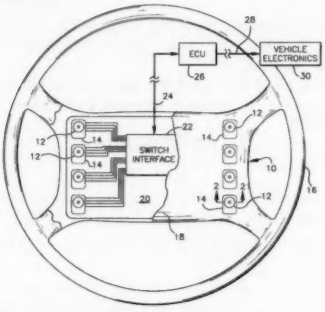
FLEXIBLE SWITCH APPARATUS AND METHOD FOR MAKING SAME

George B. Wolfe, Plymouth, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Oct. 21, 1998, Appl. No. 176,186

Int. Cl.[7] H10H *1/10*

U.S. Cl. 200—512 **16 Claims**



3. A switch apparatus comprising:

a substrate of a resilient material having a substantially planar first surface, a channel formed through said substrate to define a flex portion of said substrate, at least part of said flex portion of said substrate being movable relative to said substrate between a first position and a second position which is different from the first position;

a layer of an elastic material disposed over at least a substantial portion of said first surface of said substrate, said layer of elastic material urging said flex portion to the first position of said flex portion; and

a switch element operatively associated with said flex portion of said substrate, said switch element having an electrical condition which varies as a function of the position of said flex portion relative to said substrate;

said switch element further including a substantially rigid housing having a sidewall portion which extends outwardly from the first surface of said flex portion and terminates in an end portion of said housing spaced from said substrate, said layer of elastic material integrally connected with a substantial part of said housing.

6,040,543

EXPLOSION PROOF TOGGLE SWITCH

Nabil L. Mina, Roselle; Santosh Vilanilam, Hinsdale, and Garrett S. Yarbrough, Chicago, all of Ill., assignors to EGS Electrical Group LLC, Skokie, Ill.

Filed Aug. 13, 1999, Appl. No. 373,948

Int. Cl.[7] H01H *21/80*

U.S. Cl. 200—559 **10 Claims**

1. A toggle switch comprising:

a housing having electrical contact means contained in a cavity thereof and operatively connectable to electrically conductive terminals extending through said housing;

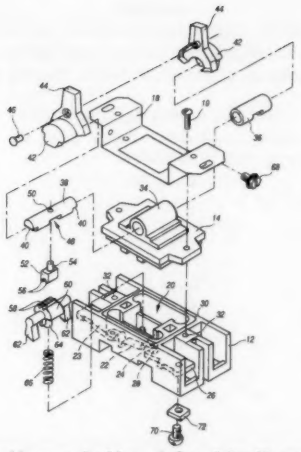
a cover for covering the cavity of said housing;

said cover being formed with an integrally formed transverse journal portion;

a bushing received by said journal portion;

a shaft received by said bushing and being rotatable therein; and

a pair of interconnected handle members each engaging a respective end of said shaft;



wherein said cover, bushing, shaft and handle members are removable from said housing as a unitary assembly.

6,040,544

OPTOELECTRONIC SEPARATION APPARATUS

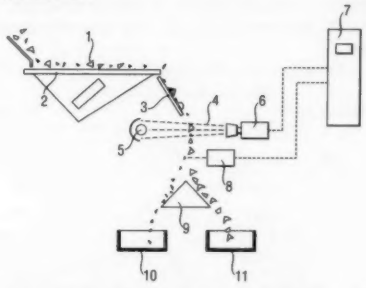
Matthäus Schantz, Rēut; Franz Köppl, Erlbach, and Dirk Flottmann, Altötting, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 8, 1998, Appl. No. 75,033

Claims priority, application Germany, May 9, 1997, 197 19 698

Int. Cl.[7] B07C *5/00*

U.S. Cl. 209—577 **7 Claims**



1. An apparatus for the optoelectronic classification and separation of semiconductor material comprising:

a separating device (**2**);

a slide face (**3**) adjacent to said separating device, and means for adjusting the angle of the slide face (**3**) to the horizontal so that a center of gravity of the material to be separated is as low as possible;

said separating device (**2**) and said slide face (**3**) each having a surface made of the semiconductor material to be separated;

a radiation source (**5**) producing a beam path (**4**), and said semiconductor material to be separated falling through said beam path (**4**) so that the largest projection surface of the material during the falling faces the radiation source;

a shape recognition device (**6**) for transmitting a shape of the semiconductor material to be separated to a control unit (**7**); and

at least one diverter device (**8**) being controlled by said controller unit (**7**) for diverting and separating said semiconductor material.

6,040,545

TIG WELDING METHOD AND WELDING APPARATUS

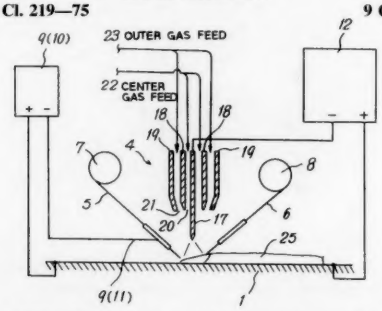
Keishi Taki, Yokohama, and Yutaka Yanagi, Ichikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 9, 1998, Appl. No. 93,717

Claims priority, application Japan, Jun. 10, 1997, P.9-152716; May 26, 1998, P.10-144882

Int. Cl.[7] B23K *9/167*

U.S. Cl. 219—75 9 Claims



1. A TIG welding method in which inner and outer double gas shields are formed coaxially around a tungsten electrode to generate an arc and a plurality of wires as filler material are continuously fed to the arc generating portion to perform a TIG welding operation, wherein at least one of the wires is fed under a heated condition as a hot wire and at least one of other wires is fed under a non-heated condition as a cold wire for cooling a molten pool.

6,040,546

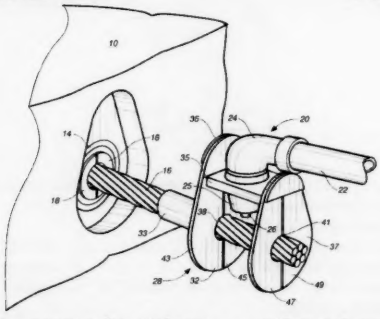
METHOD AND APPARATUS FOR CUTTING A TENDON USED IN A POST-TENSION ANCHOR SYSTEM

Felix L. Sorkin, 4115 Greenbriar Dr., P.O. Box 1503, Stafford, Tex. 77477

Filed May 23, 1999, Appl. No. 317,097

Int. Cl.[7] B23K *9/00*

U.S. Cl. 219—121.39 19 Claims



1. An apparatus for attachment to a cutting torch used for severing a tendon used in a post-tension anchor system, the apparatus comprising:

a first shield having an opening formed therein, said opening adapted to allow the tendon to pass therethrough;

a tubular extension extending outwardly of said first shield at said opening, said tubular extension having an interior adapted to extend around the tendon on a side of said first shield; and

a bracket member affixed to said first shield and adapted to attach to the cutting torch such that the cutting torch has a nozzle residing on an opposite side of said first shield.

6,040,547

GAS DISCHARGE DEVICE

Tatijana Borisovna Antonova; Gleb Elmirovich Bougrov, both of Moscow, Russian Federation; Sergey Gennadievich Kondranin; Elena Alexandrovna Kralkina, both of Seoul, Rep. of Korea; Vladimir Borisovich Pavlov, Moscow, Russian Federation; Andrej Fedorovich Alexandrov, Moscow, Russian Federation, and Anri Amvrosievich Rukhadze, Moscow, Russian Federation, assignors to Plasma Tech Co., Ltd., Rep. of Korea

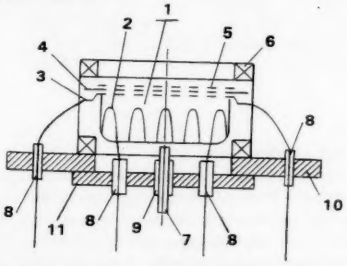
PCT No. PCT/KR97/00225, § 371 Date Jun. 7, 1999, § 102(e) Date Jun. 7, 1999, PCT Pub. No. WO98/22969, PCT Pub. Date May 28, 1998

PCT Filed Nov. 18, 1997, Appl. No. 101,922

Claims priority, application Russian Federation, Nov. 18, 1996, 96122058

Int. Cl.[7] B23K *10/00*

U.S. Cl. 219—121.43 8 Claims



1. Gas discharge device comprising an axially symmetric chamber at least having one face wall, an HF power input unit for inputting the HF power to the chamber, coaxially arranged on the external wall of the chamber, and a magnetic system for providing a stationary magnetic field of which the magnetic induction decreases not only in the radial direction towards the chamber axis of symmetry but also in the longitudinal direction from the area in which the HF power input unit is located inside the chamber, characterized in that the HF power input unit is fabricated as an conductor of zigzag recurrent symmetric shape arranged on the face wall and lateral wall of the chamber, and in that the magnetic system is adjusted to generate the magnetic field of which the magnetic induction decreases in the longitudinal direction towards the face part of the chamber opposite to the area where the HF power input unit is arranged.

6,040,548

APPARATUS FOR GENERATING AND DEFLECTING A PLASMA JET

Oleg Siniaguine, San Jose, Calif., assignor to IPEC Precision, Inc., Bethel, Conn.

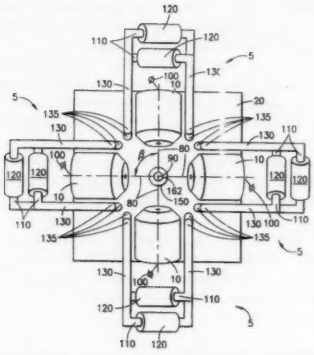
PCT No. PCT/US97/09252, § 371 Date Nov. 25, 1998, § 102(e) Date Nov. 25, 1998, PCT Pub. No. WO97/46056, PCT Pub. Date Dec. 4, 1997

Provisional application No. 60/018,857, May 31, 1996. This PCT application May 30, 1997, Appl. No. 194,246.

Int. Cl.[7] B23K *10/00*

U.S. Cl. 219—121.48 8 Claims

1. A plasma generator (**5**) for generating and deflecting a plasma jet comprising an electrode chamber (**10**) having a gas inlet (**50**); and an outlet orafice (**40**); an electrode (**60**) positioned within the electrode chamber, the electrode defining an electrode axis (**80**); and a first magnetic deflection system for applying a first magnetic field (**B1**) to a plasma flowing from the electrode chamber outlet so as to cause the plasma to flow away from the electrode axis in a first direction as a result of a first force (**F1**) on the plasma caused by the first magnetic field, the first magnetic deflection system comprising a first U-shaped member formed from a first base (**110**) and a pair of first poles (**130**) having ends (**135**) and a first coil (**120**) positioned about the base, wherein the first magnetic deflec-



tion system is positioned about the electrode chamber so that the poles of the pair of first poles are on opposite sides of the electrode axis defined by the electrode positioned within the electrode chamber;

the generator being further characterized in that:

the generator is provided with a second magnetic deflection system for applying a second magnetic field to a plasma flowing from the electrode chamber outlet so as to cause the plasma to flow away from the electrode axis in a second direction as a result of a second force (**F2**) on the plasma caused by the second magnetic field, the second magnetic deflection system comprising a second U-shaped member formed from a second base (**110**) and a pair of second poles (**130**) having ends (**135**) and a second coil (**120**) positioned about the second base, wherein the second magnetic deflection system is positioned about the electrode chamber so that the poles of the pair of second poles are on opposite sides of the electrode axis defined by the electrode positioned within the electrode chamber, and wherein the first pair of poles and the second pair of poles are uniformly positioned about the electrode axis so that the magnetic field across the first pair of poles is substantially perpendicular to the magnetic field across the pair of second poles.

6,040,549

LASER BEAM MACHINING APPARATUS AND CORRESPONDING METHOD WHICH EMPLOYS A LASER BEAM TO PRETREAT AND MACHINE A WORKPIECE

Masaru Kanaoka, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

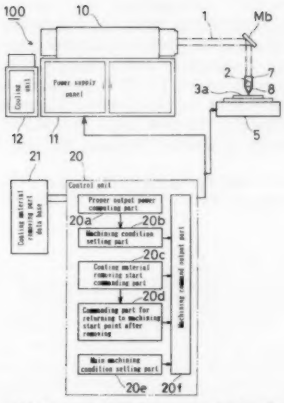
Continuation of application No. 08/395,826, Feb. 28, 1995, abandoned. This application Oct. 14, 1997, Appl. No. 949,394. Claims priority, application Japan, Feb. 28, 1994, 6-030262

Int. Cl.[7] **B23K** *26/00*

U.S. Cl. 219—121.61 **20 Claims**

15. A laser beam machining method comprising a preliminary machining step for pretreating a workpiece and a main machining step for machining the workpiece along a final machining locus;

the preliminary machining step including steps for irradiating a laser beam along the final machining locus, under preliminary machining conditions so as to evenly obtain an energy density and an energy distribution different from an energy density and an energy distribution in at least one of main machining conditions for cutting and welding and thermal treatment in the main machining step, so as to remove beforehand a surface material of the workpiece; and



the main machining step including a step for irradiating the laser beam to an area of the workpiece on which the surface substance has been removed, while changing the energy density and the energy distribution of the laser beam according to the main machining condition, so as to machine the workpiece.

6,040,550

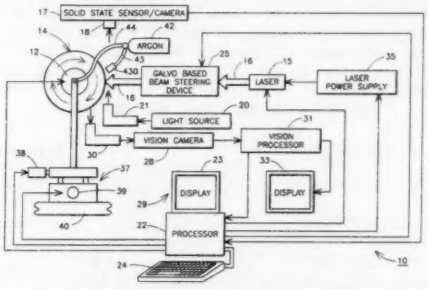
APPARATUS AND METHOD FOR LASER WELDING THE OUTER JOINTS OF METAL BELLOWS

Dale U. Chang, 2900 Sun Bittern Ct., Windermere, Fla. 34786

Provisional application No. 60/029,823, Oct. 28, 1996. This application Aug. 29, 1997, Appl. No. 921,292.

Int. Cl.[7] **B23K** *26/00*

U.S. Cl. 219—121.63 **61 Claims**



1. An apparatus for making a metal bellows of a type comprising a plurality of bellows diaphragms joined together, said apparatus comprising:

a laser for generating a laser beam;

an arbor for rotating a plurality of bellows diaphragms positioned together in side-by-side relation adjacent said laser;

optical tracking means for optically tracking a position of a rotating outer joint of the plurality of bellows diaphragms as said arbor rotates; and

beam steering means for steering the laser beam for edge welding the rotating outer joint responsive to the optical tracking means such that the laser beam is steered to impinge concurrently on an outer peripheral edge of each of at least a pair of stacked diaphragms.

6,040,551

APPARATUS FOR HARDENING THE INSIDE CONTOUR OF A GUN BARREL WITH LASER RADIATION

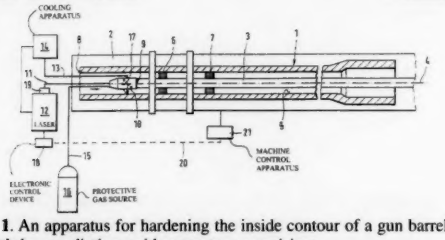
Herbert Manz, Leverkusen; Haluk Tuncer, Düsseldorf, and Manfred Zaeper, Unterüss, all of Germany, assignors to Rheinmetall W & M GmbH, Unterluss, Germany

Filed Sep. 18, 1998, Appl. No. 156,501

Claims priority, application Germany, Sep. 18, 1997, 197 41 028

Int. Cl.[7] **B23K** *26/00;26/14*

U.S. Cl. 219—121.65 **6 Claims**



1. An apparatus for hardening the inside contour of a gun barrel with laser radiation, said apparatus comprising:

a ND:YAG laser; a program controlled groove cutting machine having a drawing rod which is pulled during linear displacement, and means for centering the rod in a gun barrel for displacement in the direction of a bore axis of the gun barrel; a laser head secured to the muzzle end of the rod for displacement along the boare axis of the gun barrel; an optical fiber connecting the output radiation of the laser to said laser head; and, beam-deflecting optics disposed in said laser head for guiding laser radiation exiting said optical fiber out of the laser head via a beam exit opening in a direction onto the inside surface of the gun barrel in a direction perpendicular to the inside surface of the gun barrel.

6,040,552

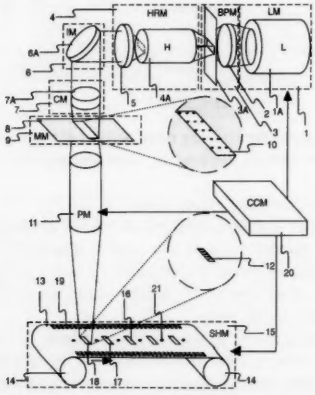
HIGH-SPEED DRILLING SYSTEM FOR MICRO-VIA PATTERN FORMATION, AND RESULTING STRUCTURE

Kanti Jain, 18 Algonquian Trail, Briarcliff Manor, N.Y. 10510; Thomas J. Dunn, 1497 Cross Rd., Mohegan Lake, N.Y. 10547; Nestor O. Farmiga, 43 Ward St., Clifton, N.J. 07011; Carl Weisbecker, 122 Fairview Ave., Port Chester, N.Y. 10573, and Carl C. Kling, 22 Annadale St., Armonk, N.Y. 10504

Filed Jan. 30, 1997, Appl. No. 794,217

Int. Cl.[7] **B23K** *26/00*

U.S. Cl. 219—121.7 **28 Claims**



26. A vertical mask and projection sub-subassembly (**26**) for use in a mask-patterned laser via-drilling system, for installation optically downstream from a source of uniformized, shaped laser radiation, processed by upstream optics into a positionally-reduced sub-beam in any assigned beamline position **1**, **2**, **3** . . . n in a set of beamline positions **1**–n, each beamline position being assigned for imaging a via-drilling pattern onto a substrate segment, as a second sub-subassembly to work downstream from any first sub-subassembly in optical series said vertical mask/projection sub-subassembly, comprising:

mask pattern means (**9**), positioned for receiving the said related balanced sub-beam from a first sub-subassembly mounted in the assigned beamline position, for forwarding a mask-patterned sub-beam for the beamline position; and

projection means (**11**) positioned for receiving the mask-patterned sub-beam for the beamline position from said related mask pattern means (**9**), and for imaging said mask-patterned sub-beam for the beamline position onto a receiving means.

6,040,553

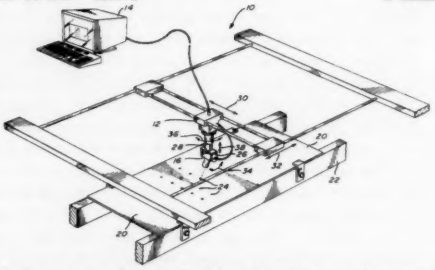
METHOD OF MANUFACTURING AIR CONVEYOR PANELS BY LASER ABLATION DRILLING

Yvan Ross, Richelieu, Canada, assignor to GEBO Conveyors Consultants & Systems, Inc., Canada

Filed Oct. 29, 1998, Appl. No. 182,331

Int. Cl.[7] **B23K** *26/00*

U.S. Cl. 219—121.71 **8 Claims**



1. An automated method of manufacturing an air conveyor panel, the panel comprising an array of holes used as air nozzles, the method comprising the steps of:

(a) mapping the desired location, shape and axial orientation of cavities in said panel with a computer;

(b) sequentially directing a laser beam at each desired location of cavities with said computer;

(c) sequentially laser ablation drilling said cavities by photothermally vaporizing a portion of said panel at each desired location, a major portion of said cavities consisting of holes piercing said panel for use as the air nozzles, and

wherein the laser beam has an intensity sufficient to photothermally vaporize a portion of said panel at each desired location.

6,040,554

WELDING ROBOT CONTROL SYSTEM

Akihiro Terada, Fujiyoshida, and Mitsuhiro Okuda, Oshinomura, both of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

PCT No. PCT/JP97/02532, § 371 Date Mar. 19, 1998, § 102(e) Date Mar. 19, 1998, PCT Pub. No. WO98/03294, PCT Pub. Date Jan. 29, 1998

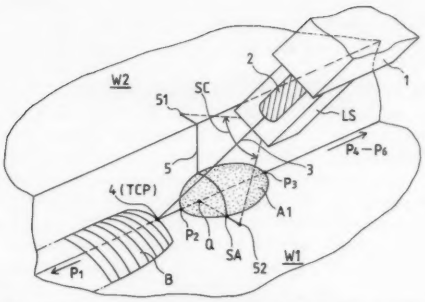
PCT Filed Jul. 22, 1997, Appl. No. 43,487

Claims priority, application Japan, Jul. 19, 1996, 8-207641

Int. Cl.[7] **B23K** *9/127*

U.S. Cl. 219—124.34 **6 Claims**

1. A control system for controlling a welding robot for performing arc welding by moving a welding torch mounted on a robot hand along a welding reference line, said system comprising:



a laser sensor mounted on said robot hand, for repeatedly detecting a characteristic point of a joint shape of workpieces by scanning a region in an advancing directions of said welding robot with a laser beam;

properness determining means for determining whether the detected characteristic point is proper or improper as a point representing a position of said welding reference line, when the characterizing point is detected by said laser sensor;

first storing means for storing data representing the position of the detected point as data of a welding reference line representative point when the detected characteristic point is determined to be proper by said properness determining means;

detection substitutive point determining means for determining a detection substitutive point to be substituted for the detected characteristic point when it is determined that the detected characteristic point is improper by said properness determining means or when the characteristic point is not detected by said laser sensor;

second storing means for storing data representing a position of the detection substitutive point as data of the welding reference line representative point; and

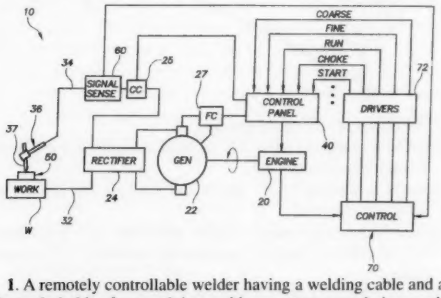
means for successively determining a target point of movement of said welding robot, based on the data of the welding reference line representative point stored in said first storing means and the data of the welding reference line representative point stored in said second storing means.

6,040,555

REMOTE CONTROL FOR WELDERS AND METHOD THEREFOR

Randolph C. Tiller, Glenview, Ill., and Robert G. Williams, Appleton, Wis., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 20, 1998, Appl. No. 27,330
Int. Cl.[7] B23K *9/10*
U.S. Cl. 219—132 **42 Claims**



1. A remotely controllable welder having a welding cable and an electrode holder for supplying weld current to a workpiece and a start switch for starting the welder, the system comprising:

a remote device having a start signal circuit having a constant current source circuit electrically coupleable between the workpiece and the electrode holder, the start signal circuit produces a start signal on the welding cable when coupled between the workpiece and electrode holder;

a sensor circuit disposed along the welding cable, the sensor circuit producing a start sense signal in response to detecting the start signal on the welding cable;

a start control circuit coupled between the sensor circuit and the start switch, the start control circuit at least temporarily actuating the start switch in response to detection of the start sense signal;

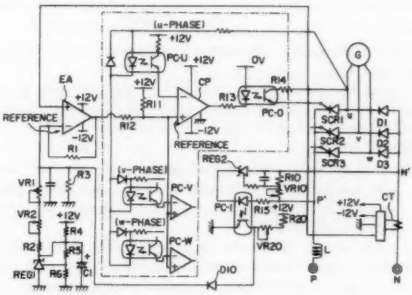
whereby the welder is energizable when the start signal circuit is electrically coupled between the workpiece and the electrode holder.

6,040,556

ENGINE DRIVEN ARC WELDER

Keigo Shinya; Wen Long Kou, both of Koka-gun; Osamu Suzuki, and Shunichi Tetsui, both of Kawagoe, all of Japan, assignors to Denyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Sep. 30, 1998, Appl. No. 162,785
Claims priority, application Japan, Oct. 1, 1997, 9-268950
Int. Cl.[7] B23K *9/095*
U.S. Cl. 219—133 **1 Claim**



1. An engine driven arc welder comprising:

a welding generator driven by an engine;

an output circuit for controlling output of the welding generator in accordance with a control signal to deliver the output to the welding output terminals;

a current detector for detecting current flowing in the welding output terminals;

an error detector for comparing the output of the current detector with a reference signal to detect error therebetween;

a control signal producing circuit which produces a control signal in accordance with the output of the error detector and which delivers the control signal to said output circuit;

a voltage detector for detecting the voltage applied to the welding output terminals;

said welder showing a welding output characteristic having a constant current control arc characteristic in accordance with the reference signal and exhibiting a drooping characteristic in the vicinity of the arcing voltage and a further constant current control arc characteristic with an increasing current when the arc voltage is lowered; and

an adjustment circuit for determining the magnitude of the reference signal to be delivered to the error detector in accordance with the output of said voltage detector,

thereby to change the reference signal to allow an inter-characteristic transfer point between the constant current control arc characteristic and the drooping characteristic to be adjustable wherein said adjustment circuit changes the reference signal to allow the inter-characteristic transfer voltage from the constant current control arc characteristic corresponding to arc current to the drooping characteristic to be adjustable, and changes the reference signal to allow inter-characteristic transfer current from the drooping characteristic to the constant current control arc characteristic corresponding to short-circuit current to be adjustable.

6,040,557

DROP-IN AIR HEATER FOR AN ENGINE WITH HEATER SUPPORT FRAME HAVING PRONGS ENGAGING HEATER HOLDERS

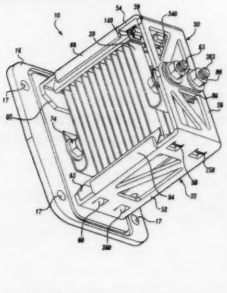
Andrew J. Prust, Coon Rapids, and Jan P. Thimmesch, Eden Prairie, both of Minn., assignors to Phillips & Temro Industries Inc., Eden Prairie, Minn.

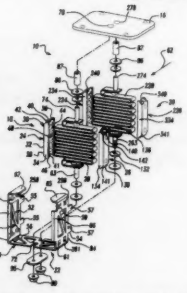
Continuation-in-part of application No. 09/209,388, Dec. 10, 1998. This application Feb. 10, 1999, Appl. No. 248,510.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] F02M *31/12*

U.S. Cl. 219—206 **18 Claims**





1. An air intake for an internal combustion engine, said air intake comprising:

an air intake tube having a passage for communicating air and defining a direction of airflow, the air intake tube including a cavity communicating with the passage; and

a heater including:

a mounting flange coupling the heater to the air intake tube and sealing said cavity, said mounting flange defining a plane substantially parallel to said direction of airflow through said heater,

a frame coupled to the mounting flange, said frame having a pair of opposed upright walls, said flange and said frame defining a channel for communicating air through said heater, each upright wall having an upstream face and a downstream face relative to said direction of airflow,

a heating element assembly in heat transfer relationship with the air passage, and

stops extending from one of said upstream and downstream faces of said upright walls to limit movement of said heating element assembly in a first direction within said channel.

6,040,558

IMAGE HEATING APPARATUS

Michihito Yamazaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1998, Appl. No. 71,160

Claims priority, application Japan, May 14, 1997, 9-137995

Int. Cl.[7] G03G *15/20*

U.S. Cl. 219—216 **37 Claims**

1. An image heating apparatus comprising:

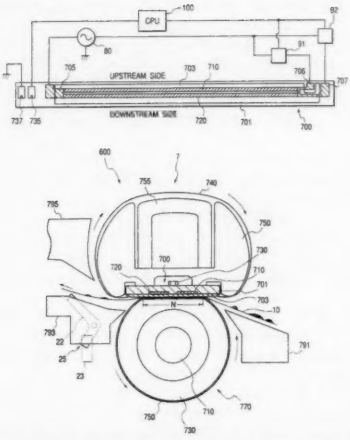
a heater;

a film sliding on said heater; and

a back-up member for forming a nip with said heater via said film, said back-up member receiving a driving force to drive said film;

wherein a recording material bearing an image thereon is pinched and conveyed in said nip whereby the image on said recording material is heated by the heat supplied from said heater via said film;

said heater includes a first heat-generating member for generating heat by electric power supply thereto, and a second heat-generating member, provided at the downstream side of said first heat-generating member with respect to the moving direction of the recording material, for generating heat by electric power supply thereto; and



wherein an amount of heat generation is substantially equivalent for said first and second heat-generating members when there is an absence of the recording material in said nip when electric power is supplied to said first and second heat-generating members, and the amount of heat generation of said first heat-generating member is larger than that of said second heat-generating member when there is a presence of the recording material in said nip.

6,040,559

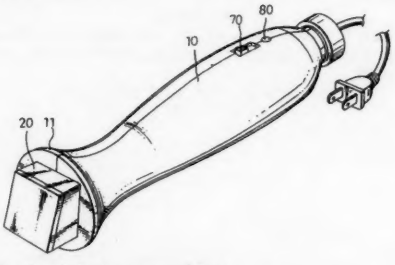
ELECTRIC HEAT PEN WITH SANDWICHED HEATER ELEMENT

Ammy Chou, Taipei, Taiwan, assignor to Welcome Company, Ltd., Taiwan

Filed Mar. 21, 1997, Appl. No. 821,473

Int. Cl.[7] H05B *1/00*

U.S. Cl. 219—229 **6 Claims**



1. An electric heat pen comprising:

a pen base adapted to be held in the hand of a user, said pen base having a longitudinal axis;

a pen head fastened to one end of said pen base and defining a receiving chamber;

an electric heating element mounted inside the receiving chamber of said pen head and electrically connected to produce heat;

an upper conductor and a lower conductor respectively disposed in contact with said electric heating element, said electric heating element being actuated to produce heat when said upper conductor and said lower conductor are respectively connected to two opposite terminals of power supply; and

a hot plate that covers said receiving chamber of said pen head and that is heated by said electric heating element, said hot plate forming a non-zero angle with said longitudinal axis of said pen base;

wherein said receiving chamber of said pen head is covered with a top cover, and a spring plate is mounted inside said receiving chamber, and attached to said top cover to impart a downward pressure to said upper conductor against said electric heating element and said lower conductor; and

wherein a steel plate is sandwiched in between said spring plate and said upper conductor, and an electrically insulative heat resisting film is sandwiched in between said upper conductor and said steel plate.

6,040,560

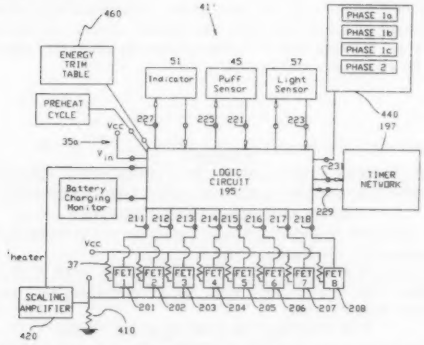
POWER CONTROLLER AND METHOD OF OPERATING AN ELECTRICAL SMOKING SYSTEM

Grier S. Fleischhauer, Midlothian; Charles T. Higgins; D. Bruce Losee, both of Richmond, all of Va.; J. Robert Nelson, Jr., Easton, Conn.; Robert L. Ripley, Midlothian, Va.; Masato Sano, Sumoto, Japan; David E. Sharpe, Chesterfield, and Michael L. Watkins, Chester, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of application No. 08/755,044, Oct. 22, 1996, abandoned. This application Oct. 16, 1997, Appl. No. 951,255.

Int. Cl.[7] H05B *1/02*

U.S. Cl. 219—494 **82 Claims**



1. A method of controlling application of electrical power from a power source to heater elements of an electrically operated smoking system, said method comprising the steps of:

establishing in a controller of the electrical smoking system an executable power cycle comprising at least first and second differentiated phases, said establishing step providing each of said first and second differentiated phases with a preselected time period (t_{phase}), an adjustable duty cycle (dc_{phase}) and a preselected total energy (J_{phase}), respectively; and

responsively to a puff on the smoking system, modulating power application to a heater element during each of said first and second differentiated phases in accordance with said established power cycle by:

referencing a voltage of a power source; and

adjusting said duty cycle of said phase responsively to said referencing step such that said respective preselected total energy level of said phase is achievable within said respective preselected time period of said phase.

6,040,561

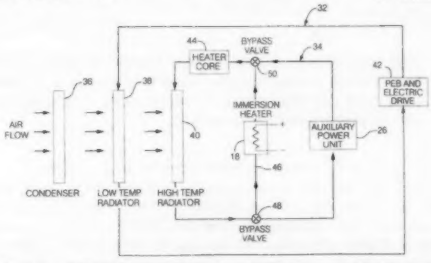
HIGH VOLTAGE BUS AND AUXILIARY HEATER CONTROL SYSTEM FOR AN ELECTRIC OR HYBRID VEHICLE

Balarama Vempaty Murty, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 30, 1999, Appl. No. 343,735

Int. Cl.[7] H05B *1/02*

U.S. Cl. 219—494 **15 Claims**



1. An auxiliary heater control system for a vehicle having a climate control system and one or more wheels powered by an electric motor that is energized from a power source via a voltage supply bus, said heater control system comprising:

a heater control circuit having an electric heating element that is electrically coupled to the voltage supply bus and thermally coupled to the climate control system to provide heat for use by the climate control system using energy from the power source, said heater control circuit further including an input and being responsive to a control signal on said input to provide operating power from the voltage supply bus to said heating element; and

a vehicle system controller having an input for receiving a cabin heat request from the climate control system and having an output coupled to said input of said heater control circuit, said system controller being responsive to a cabin heat request to provide said heater control circuit with said control signal, whereby said electric heating element provides heat to the climate control system in response to a cabin heat request;

wherein said vehicle system controller is operable to monitor the voltage on the voltage supply bus and to provide said control signal to said heater control circuit when the monitored voltage exceeds a lower threshold voltage, whereby said electric heating element dissipates energy supplied to said voltage supply bus when the monitored voltage exceeds the lower threshold voltage.

6,040,562

STRUCTURE FOR UNIFORM HEATING IN A HEATING DEVICE

Masahisa Tokumoto, and Eiji Ishibashi, both of Kitakyushu, Japan, assignors to Kabushiki Kaisha Kyushu Nissho, Japan

Filed Dec. 15, 1997, Appl. No. 991,007

Claims priority, application Japan, Nov. 13, 1997, 9-312461; Nov. 13, 1997, 9-312469

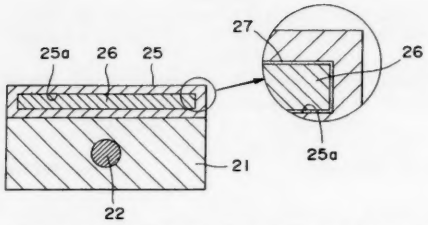
Int. Cl.[7] B23K *3/00*

U.S. Cl. 219—530 **10 Claims**

1. A uniform heating structure with a planar heat transfer surface comprising:

a square or rectangular cross-sectioned main block unit comprising a heat-resistant metal, and having a planar heat transfer surface with a surface area,

a heater completely embedded in the main block unit.



a high thermal-conductivity material interposed between the heat transfer surface and the heater and having a thermal conducting area approximately corresponding to the surface area of planar heat transfer surface.

6,040,563

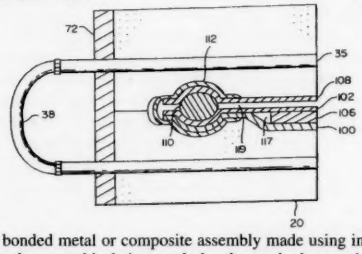
BONDED ASSEMBLIES

Marc R. Matsen, Seattle, and Douglas A. McCarville, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of application No. 08/468,116, Jun. 6, 1995, Pat. No. 5,793,024, which is a continuation-in-part of application No. 08/169,655, Dec. 16, 1993, Pat. No. 5,530,227, which is a continuation-in-part of application No. 07/777,739, Oct. 15, 1991, Pat. No. 5,410,132, which is a continuation-in-part of application No. 08/092,050, Jul. 15, 1993, Pat. No. 5,410,133, which is a division of application No. 07/681,004, Apr. 5, 1991, Pat. No. 5,229,562, which is a continuation-in-part of application No. 08/151,433, Nov. 12, 1993, Pat. No. 5,420,400. This application Dec. 22, 1997, Appl. No. 995,387.

Int. Cl.[7] H05B *6/10*

U.S. Cl. 219—633 **9 Claims**



1. A bonded metal or composite assembly made using induction heating, the assembly being made by the method comprising the steps of:

(a) assembling at least two workpieces to sandwich at least one bonding material selected from the group consisting of temperature-activated adhesives, braze alloys, and bonding agents to form an assembly;

(b) enclosing the assembly in a sealable retort including a metal susceptible to heating inductively;

(c) placing the assembly and retort in an induction heating press;

(d) energizing the induction heating press to heat the retort and, in turn, the bonding material until the bonding material melts;

(e) de-energizing the induction heating press to cool the retort and, in turn, the bonding material to bond the workpieces together to form bonded workpieces;

(f) recovering the bonded workpieces in the retort from the press;

(g) optionally, placing shims at selected locations within the retort and the workpieces to define a bondline where the workpieces will be bonded and bead regions where the workpieces do not bond; and

(h) optionally, forming at least one workpiece by stretching or expanding that workpiece in at least one bead region by introducing pressure into the retort, wherein the energizing step heats the retort with subsequent transfer of heat from the retort to the bonding material through the workpieces.

6,040,564

MICROWAVE HEATING APPARATUS AND MICROWAVE HEATING METHOD

Shigeki Ueda; Ikuhiro Inada, both of Yamatokoriyama, and Satomi Uchiyama, Nara, all of Japan, assignors to Matsushita Electric Indutrial Co., Ltd., Osaka, Japan

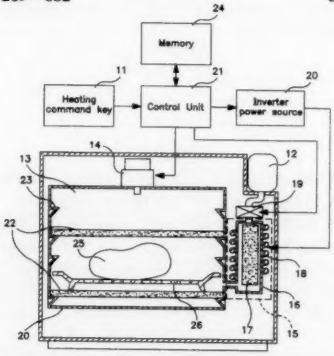
PCT No. PCT/JP96/02868, § 371 Date Sep. 17, 1998, § 102(e) Date Sep. 17, 1998, PCT Pub. No. WO97/13102, PCT Pub. Date Apr. 10, 1997

PCT Filed Oct. 2, 1996, Appl. No. 51,254

Claims priority, application Japan, Oct. 4, 1995, 7-257376

Int. Cl.[7] H05B *6/80*

U.S. Cl. 219—682 **36 Claims**



1. A microwave heating apparatus comprising a heating chamber for accommodating an object to be heated, steam generating means for supplying superheated steam having temperature of more than 100° C. to the heating chamber, superheated steam maintaining means for preventing the temperature of the superheated steam from decreasing in the heating chamber, said maintaining means composed of a wall surface of the heating chamber capable of absorbing moisture, and microwave generating means for irradiating the object with microwaves.

6,040,565

OVEN OPERATION ONLY UPON DETECTING OF AN IDENTIFICATION MARK ON A FOOD OR BEVERAGE CONTAINER PLACED IN THE OVEN

Jan Åkerlind, Stockholm, Sweden, assignor to CD Food Technology AB, Stockholm, Sweden

PCT No. PCT/SE96/01143, § 371 Date Mar. 2, 1998, § 102(e) Date Mar. 2, 1998, PCT Pub. No. WO97/11342, PCT Pub. Date Mar. 27, 1997

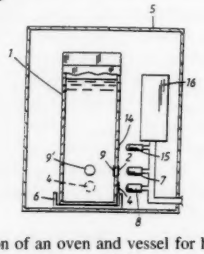
PCT Filed Sep. 13, 1996, Appl. No. 29,882

Claims priority, application Sweden, Sep. 15, 1995, 9503201

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H05B *6/68;* **G01K** *11/12*

U.S. Cl. 219—705 **25 Claims**



1. A combination of an oven and vessel for heating preparation of food-stuffs or beverages, comprising:

an oven for heating food-stuffs or beverages;

a vessel having a food-stuff or beverage therein, and dimensioned to fit within said oven, and having an information

carrier having at least one optically readable control information field, said information carrier for indicating the temperature of a food-stuff or beverage within said vessel;

said vessel provided with an identification marking comprising at least one hologram;

a control device for said oven; and

detecting means disposed within said oven for detecting said identification marking, and for actuating said control device as to permit operation of said oven only if at least one predetermined identification requisite is met.

6,040,566

DEVICE TO CONTROL THE AIMING AND FOCUSING OF LASER SYSTEMS ON A TARGET

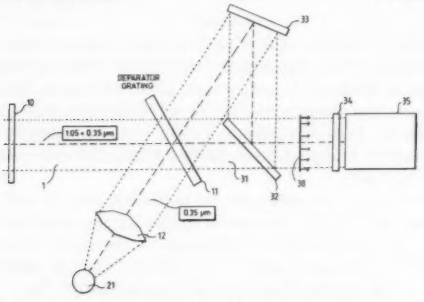
Jacques Rioland, Eaubonne; Paul Thibout, Guyancourt, and Patrice Jano, Seine Port, all of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 20, 1998, Appl. No. 9,180

Claims priority, application France, Jan. 31, 1997, 97 01072

Int. Cl.[7] G11B *7/09*

U.S. Cl. 250—201.9 **9 Claims**



1. A device for aiming and focusing a laser beam on a target, said device comprising:

at least one reflecting false target positioned and oriented substantially identically to a target to be impinged by a laser beam;

a separator device configured to receive the laser beam, transmit a first portion of the laser beam having a first wavefront, and reflect a second portion of the laser beam having a second wavefront, said first wavefront and said second wavefront having substantially the same wavelength;

a lens configured to receive the second portion of the laser beam reflected by the separator device and to focus the second portion of the laser beam on the reflecting false target;

a first mirror configured to receive the second portion of the laser beam reflected off of the reflecting false target and to reflect the second portion of the laser beam;

a second mirror configured to receive the second portion of the laser beam reflected off of the first mirror, reflect the second portion of the laser beam, receive the first portion of the laser beam transmitted by the separator device, and transmit the first portion of the laser beam, said second mirror being a semi-reflective mirror; and

a wavefront analyzer configured to receive the first portion of the laser beam transmitted by the separator device, receive the second portion of the laser beam reflected by the second mirror, and make aiming and focusing measurements for t he laser beam by performing a differential analysis of the first wavefront and the second wavefront.

6,040,567

METHOD AND DEVICE FOR CONTROLLING FAST PERIODIC MOTION

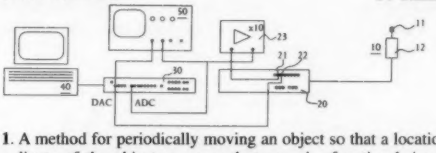
Erwin Neher, and Frank Würriehausen, both of Bovenden, Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Munich, Germany

Filed Mar. 13, 1998, Appl. No. 42,343

Claims priority, application Germany, Mar. 14, 1997, 197 10 714

Int. Cl.[7] H01J *40/14*

U.S. Cl. 250—206 **14 Claims**



1. A method for periodically moving an object so that a location coordinate of the object corresponds to an aim function being a function of time (t) at least in one periodic sub-interval of each cycle, comprising the step of driving the object so that a location of the object changes in response to a command function, wherein said command function is represented as

$$y(t) = \sum_{i}^{n} a_i \cdot A_i(t),$$

wherein a_i comprise a finite number of n command parameters and A_i comprise a finite number of series expansion functions, said command function being derivable by

parameterizing the aim function as a series expansion which is represented as

$$y'(t) = \sum_{i}^{\infty} a'_i \cdot A_i(t),$$

wherein a'_i comprise parameters of said series expansion and A_i comprise corresponding series expansion functions, and

determining n command parameters for which an optimization criterion is satisfied in the periodic sub-interval for the command function.

6,040,568

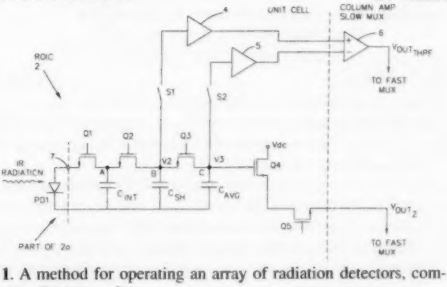
MULTIPURPOSE READOUT INTEGRATED CIRCUIT WITH IN CELL ADAPTIVE NON-UNIFORMITY CORRECTION AND ENHANCED DYNAMIC RANGE

John T. Caulfield, Santa Barbara; Richard H. Wyles, Carpinteria; John D. Schlesselmann, and Kevin L. Pettijohn, both of Goleta, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed May 6, 1998, Appl. No. 73,408

Int. Cl.[7] H01L *25/00*

U.S. Cl. 250—208.1 **20 Claims**



1. A method for operating an array of radiation detectors, comprising the steps of:

during a sampling period that defines a frame comprised of subframe periods, generating an electrical signal in individual ones of the radiation detectors, the electrical signals being generated in response to incident radiation;

in a first operating mode, forming a high pass filtered output signal from electrical signals generated during at least one frame period;

in a second operating mode, forming a subframe averaged output signal from electrical signals generated during a frame period; and

reading out, in the first operating mode, the high pass filtered output signal or, in the second operating mode, the subframe averaged output signal.

6,040,569

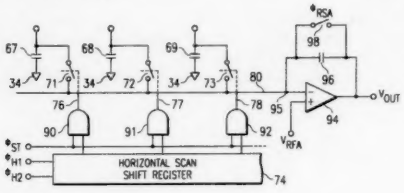
FIXED-PATTERN-NOISE REDUCTION IN ACTIVE PIXEL IMAGE SENSORS

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/046,492, May 14, 1997. This application May 14, 1998, Appl. No. 79,210.

Int. Cl.[7] H01J *40/14*

U.S. Cl. 250—208.1 **6 Claims**



1. A device for sensing light comprising:

an active pixel sensor;

a holding capacitor for storing a pixel signal from the active pixel sensor;

a scanning switch coupled between the holding capacitor and a sense line;

a switch control line for turning the switch on and off;

a logic gate having a horizontal scan shift register input and a strobe input, the switch control line is an output of the logic gate.

6,040,570

EXTENDED DYNAMIC RANGE IMAGE SENSOR SYSTEM

Peter Alan Levine, Trenton; Donald Jon Sauer, Princeton Jct, and Nathaniel Joseph McCaffrey, Lambertville, all of N.J., assignors to Sarnoff Corporation, Princeton, N.J.

Filed May 29, 1998, Appl. No. 87,087

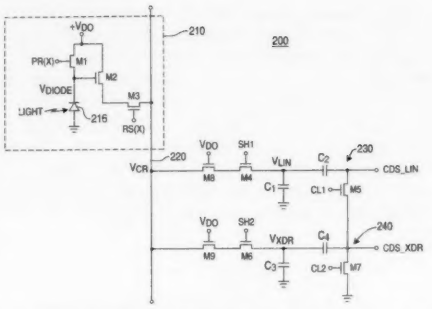
Int. Cl.[7] H01L *27/00;* **H04N** *3/14*

U.S. Cl. 250—208.1 **9 Claims**

1. An extended dynamic range imager, comprising:

(a) an array of pixels for providing an output signal for each pixel related to an amount of light captured for each pixel during an integration period;

(b) a row of extended dynamic range (XDR) sample and hold circuits having an XDR sample and hold circuit for each column of the array for capturing an XDR signal related to a difference between the output signal and an XDR clamp level to which the pixel is reset at a predetermined time before the end of the integration period; and



(c) a row of linear sample and hold circuits having a linear sample and hold circuit for each column of the array for capturing a linear signal related to a difference between the output signal and an initial output signal to which the pixel is reset at the beginning of the integration period.

6,040,571

TIME DOMAIN MULTIPLEXED AMPLIFIED SENSOR ARRAYS WITH IMPROVED SIGNAL TO NOISE RATIOS

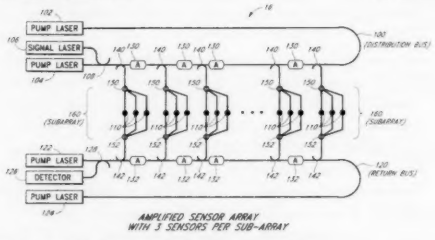
Craig W. Hodgson, Mountain View, Calif.; Jefferson L. Wagener, Charlottesville, Va.; Michel J. F. Digonnet, Palo Alto, and H. John Shaw, Stanford, both of Calif., assignors to Board of Trustees Leland Stanford Junior University, Stanford, Calif.

Continuation of application No. 08/814,548, Mar. 11, 1997, Pat. No. 5,866,898, Provisional application No. 60/021,699, Jul. 12, 1996, Provisional application No. 60/034,804, Jan. 2, 1997, Provisional application No. 60/036,114, Jan. 17, 1997. This application Jan. 26, 1999, Appl. No. 237,716.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01J *5/16*

U.S. Cl. 250—227.14 **23 Claims**



1. An optical sensor architecture comprising:

a plurality of sensors which receive an optical signal and which output perturbed optical signals;

a distribution bus coupled to each sensor to distribute the optical signal to each sensor;

a return bus coupled to each sensor to receive the perturbed optical signal from each sensor to be included as a portion of the return signal;

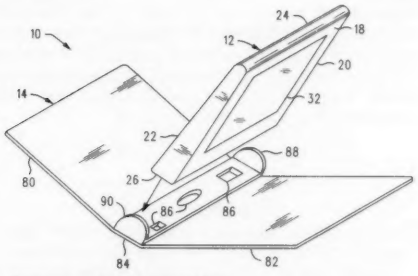
a plurality of first optical amplifiers distributed at selected positions along the length of the distribution bus to maintain the power of the distributed optical signal at a selected level; and

a plurality of second optical amplifiers distributed at selected positions along the length of the return bus to maintain the power of the perturbed optical signals in the return signal.

6,040,572
NOTEBOOK STYLED SCANNER

Modest Khovaylo, Fort Collins; Michael A. Puyot, Greeley; James C. Dow, Fort Collins, all of Colo.; Scott Henderson, Brooklyn, and Davin Stowell, New York, both of N.Y., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 21, 1998, Appl. No. 82,847
Int. Cl.[7] H01J *3/14*
U.S. Cl. 250—235 **31 Claims**



1. Scanner apparatus, comprising:

a housing having a front side and a back side;

a scanning device sized to be received by said housing;

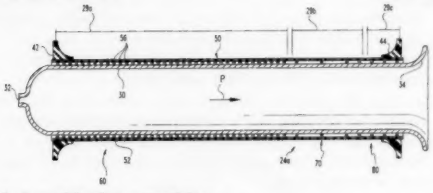
a transparent platen located on the front side of said housing, said transparent platen allowing an object positioned adjacent said transparent platen to be scanned by the scanning device; and

a window located on the back side of said housing, said window allowing a user to view at least a portion the object positioned adjacent said transparent platen.

6,040,573
ELECTRIC FIELD GENERATION FOR CHARGED PARTICLE ANALYZERS

C. Ray Sporleder, and David E. Clemmer, both of Bloomington, Ind., assignors to Indiana University Advanced Research & Technology Institute Inc., Bloomington, Ind.

Filed Sep. 25, 1997, Appl. No. 937,729
Int. Cl.[7] H01J *49/42*
U.S. Cl. 250—281 **41 Claims**



1. A combination, comprising:

determining desired characteristics of a first electric field configured to control charged particles in a charged particle analyzer;

providing a first electric field generation device corresponding to said determining by:

defining a predetermined pattern of electrical conductors on a flexible dielectric substrate, the conductors being spaced apart from each other along the substrate and being carried on the substrate to flex therewith;

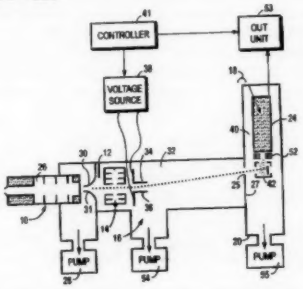
bending the substrate to provide a predetermined spatial orientation of the conductors; and

applying an electric potential to the conductors to generate the first electric field.

6,040,574
ATMOSPHERIC-PARTICLE ANALYZER

John T. Jayne, Littleton; Douglas R. Worsnop, Lexington, and Charles E. Kolb, Sudbury, all of Mass., assignors to Aerodyne Research, Inc., Billerica, Mass.

Filed Mar. 5, 1998, Appl. No. 35,048
Int. Cl.[7] H01J *49/04*
U.S. Cl. 250—288 **7 Claims**



1. An analyzer for analyzing the particulate content of an atmosphere, said apparatus comprising

A. means for extracting a sample of said atmosphere and forming a beam of the particles contained therein;

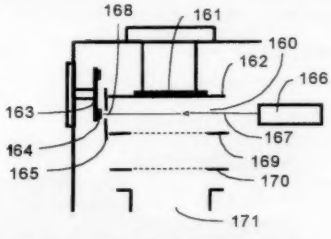
B. means for sorting the particles in the beam according to particle size; and

C. means for detecting and analyzing the volatile and semi-volatile components of the sorted particles on a per particle basis, thereby to provide a measure of the numbers and constituents of the particles of the various sizes.

6,040,575
MASS SPECTROMETRY FROM SURFACES

Craig M. Whitehouse, and Bruce A. Andrien, Jr., both of Branford, Conn., assignors to Analytica of Branford, Inc., Branford, Conn.

Provisional application No. 60/072,246, Jan. 23, 1998. This application Jan. 22, 1999, Appl. No. 235,945.
Int. Cl.[7] H01J *49/16*
U.S. Cl. 250—288 **1 Claim**



1. A method of fragmenting ions whereby:

a. ions produced in an ion source are directed to a collecting surface configured in the pulsing region of a mass analyzer, forming an ion population or neutralized molecule population at said collecting surface, said collecting surface comprising a MALDI matrix material, said mass analyzer comprising a laser configured to direct laser pulses to said collecting surface, an analyzer region and a detector;

b. pulsing said laser to create MALDI generated ions from said ion or molecule populations; and

c. accelerating said MALDI generated ions into said analyzer region of said mass analyzer for mass to charge analysis and detection.

6,040,576

ENERGY FILTER, PARTICULARLY FOR AN ELECTRON MICROSCOPE

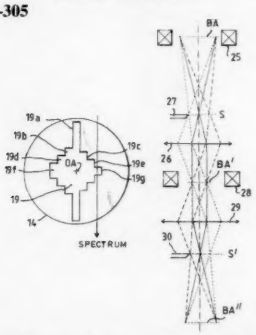
Gerd Benner, Aalen, Germany, assignor to Leo Elektronenmikroskopie GmbH, Germany

Filed Sep. 1, 1998, Appl. No. 145,397

Claims priority, application Germany, Sep. 1, 1997, 197 38 070

Int. Cl.[7] **H01J** *37/26*

U.S. Cl. 250—305 **13 Claims**



1. An energy filter having an exit image plane (BA) and a dispersion plane (S), comprising:

a diaphragm arrangement (**14**, **27**, **30**) for energy selection in said dispersion plane (S) or in a plane (S') conjugate to said dispersion plane (S), and

at least one deflecting system (**12**, **13**; **12'**, **13'**; **12'**, **25**) preceding said diaphragm arrangement (**14**, **27**, **30**), that effects a deflection of an electron beam, wherein setting of different energy bandwidths takes place by different excitation of said deflecting system (**12**, **13**; **12'**, **13'**; **12"**, **25**, **28**), which results in different deflections of said electron beam relative to said diaphragm arrangement (**14**, **27**, **30**).

6,040,577

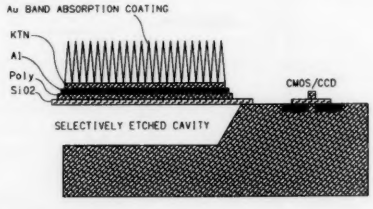
CHOPPERLESS OPERATION OF A THERMAL INFRARED RADIATION SENSOR SYSTEM BY APPLICATION OF HEAT PULSES TO THERMALLY ISOLATED PIXEL SENSOR ELEMENTS

Nicolas Mauduit, 9 rue Berthollet, 79005 Paris, France

Provisional application No. 60/023,707, Aug. 8, 1996. This application Aug. 8, 1997, Appl. No. 907,809.

Int. Cl.[7] **H01L** *27/146*

U.S. Cl. 250—338.1 **16 Claims**



1. A thermal sensor array for providing signals representative of the amount of thermal radiation in each of separate area portions of a scene producing thermal radiation which is incident upon the thermal sensor array, the array comprising:

a multiplicity of thermal-radiation-sensing pixel elements, the elements being sufficiently thermally isolated among and between each other so that each element comes to an equilibrium temperature that is proportional to thermal radiation incident upon the element from an associated portion of the scene, each element serving to produce an electrical signal in proportion to its temperature;

means for applying a heat pulse to each of the multiplicity of elements so that each element is momentarily driven to a new and higher temperature during the course of which change in temperature an electrical signal is produced;

wherein when heat pulses are applied to elements each at a different equilibrium temperature then the magnitudes of the electrical signal produced by each will vary in accordance with this difference;

wherein variations in temperature within the scene and in the separate area portions thereof are deducible from these differences, and are not required to be deduced from variations in the signal output of each of the elements at each of plural temperatures as is characteristic of conventional thermal sensor array where the electrical signals produced by the multiplicity of elements within the array are from time to time unrelated to temperature within the scene.

6,040,578

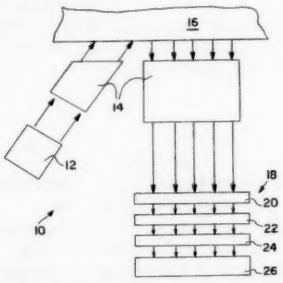
METHOD AND APPARATUS FOR MULTI-SPECTRAL ANALYSIS OF ORGANIC BLOOD ANALYTES IN NONINVASIVE INFRARED SPECTROSCOPY

Stephen F. Malin, Chanhassen, Minn., and Gamal Khalil, Chandler, Ariz., assignors to Instrumentation Metrics, Inc., Tempe, Ariz.

Filed Feb. 2, 1996, Appl. No. 597,480

Int. Cl.[7] **G01N** *21/35*

U.S. Cl. 250—339.12 **13 Claims**



1. An apparatus for determining the concentration of an organic blood analyte in a body tissue sample, comprising:

(a) means for irradiating the sample with incident radiation containing a plurality of distinct, nonoverlapping spectral regions within the infrared spectrum, wherein each of the spectral regions encompass a range of wavelengths between approximately 1100 and 5000 nanometers;

(b) means for collecting reflected radiation emerging from tie sample and directing said reflected radiation into a beam path;

(c) adjustable filter means disposed in the beam path, wherein said adjustable filter means attenuates the intensity of radiation in the beam path;

(d) principal analyte filter means capable of receiving radiation emerging from the adjustable filter means, and selectively passing discrete wavelengths therefrom, wherein said discrete wavelengths are specifically correlated with the concentration of the analyte;

(e) second filter means capable of receiving the discrete wavelengths emerging from the principal analyte filter means and attenuating the intensity of said wavelengths;

(f) detection means for receiving the attenuated wavelengths emerging from the second filter means;

(g) means for converting the detected wavelengths into a signal representative of the intensity of said wavelengths; and

(h) means for correlating the signal obtained in step (g) to determine the concentration of the analyte.

6,040,579

THERMOELECTRIC SENSOR

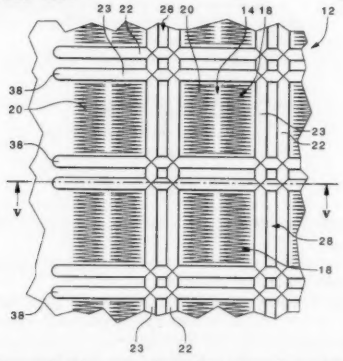
Ulrich Münch, Neuchâtel, Switzerland; Dominik Jaeggi, San Francisco, Calif., and Niklaus Schneeberger, Dübendorf, Switzerland, assignors to EM Microelectronic-Marin SA, Marin, Switzerland

Filed Feb. 25, 1998, Appl. No. 30,025

Claims priority, application European Pat. Off., Feb. 28, 1997, 97103317

Int. Cl.[7] G01J *5/12*

U.S. Cl. 250—344 **8 Claims**



1. A thermoelectric sensor formed by a membrane including a plurality of elementary cells formed respectively by a plurality of thermoelectric elements, said plurality of elementary cells defining respectively a plurality of distinct elementary surfaces of said membrane, wherein each elementary cell is thermally insulated from adjacent elementary cells by metal wires arranged on one face of said membrane and thermally connected to a substrate supporting said membrane.

6,040,580

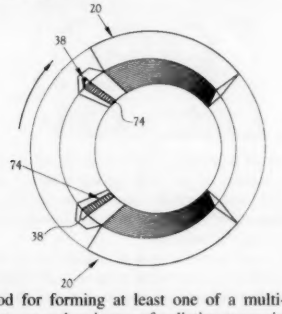
METHOD AND APPARATUS FOR FORMING MULTI-DIMENSIONAL ATTENUATION CORRECTION DATA IN TOMOGRAPHY APPLICATIONS

Charles C. Watson, and William F. Jones, both of Knoxville, Tenn., assignors to CTI Pet Systems, Inc., Knoxville, Tenn.

Continuation-in-part of application No. 08/563,268, Nov. 27, 1995, Pat. No. 5,750,991, which is a continuation-in-part of application No. 08/210,960, Mar. 21, 1994, Pat. No. 5,471,061, which is a continuation-in-part of application No. 08/037,303, Mar. 26, 1993, Pat. No. 5,296,708. This application Jan. 19, 1998, Appl. No. 8,848.

Int. Cl.[7] G01T *1/166*

U.S. Cl. 250—363.03 **12 Claims**



1. A method for forming at least one of a multi-dimensional attenuation data set and an image of radiation transmission through an object positioned in a tomograph device, said tomograph device being at least one of a positron emission tomography (PET) device, a single photon emission computed tomography (SPECT) device and an ECAT ART device, said tomograph device having radiation detectors defining a plurality of faces, said tomograph device including a plurality of collimators, said method comprising the steps of:

positioning at least one selected point source of radioactive radiation proximate at least one of said plurality of collimators in a selected sequence, said radioactive radiation being directed through the object and received by a selected subset of said radiation detectors of said tomograph device; and

processing signals received from outputs of said detectors of said tomograph device to determine transmission data from radiation from said source of radiation during passage of said radiation through the object for forming said at least one of an attenuation data set and an image.

6,040,581

GAMMA-RAY COMPENSATED NEUTRON IONIZATION CHAMBER

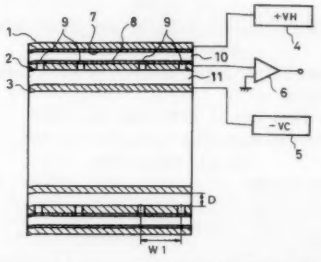
Toyokazu Gotou, and Shinji Fukakusa, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1998, Appl. No. 84,879

Claims priority, application Japan, Dec. 17, 1997, 9-348189

Int. Cl.[7] G01T *3/00*

U.S. Cl. 250—390.01 **3 Claims**



1. A gamma-ray compensated neutron ionization chamber comprising a cylindrical or plate-like high-voltage electrode to which a high voltage is applied, a cylindrical or plate-like signal electrode for taking out a neutron current, and a cylindrical or plate-like compensating electrode to which a compensating voltage is applied, these electrodes being arranged concentrically in the order named with predetermined spacing therebetween, and a plurality of holes being formed in part of the signal electrode, wherein the total area of the holes is set to a value equal to or smaller than 5% of the surface area of the signal electrode.

6,040,582

ION BEAM FOCUSER FOR AN ION IMPLANTER ANALYZER

Han-sung Kim, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Feb. 13, 1998, Appl. No. 22,794

Claims priority, application Rep. of Korea, May 13, 1997, 97-18575

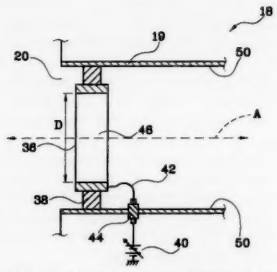
Int. Cl.[7] H01J *37/30*

U.S. Cl. 250—492.21 **9 Claims**

1. An ion analyzer for an ion implanter used for implanting ions on a semiconductor wafer surface, said ion analyzer comprising:

a curved ion analyzer chamber having an inlet and an outlet at respective ends thereof;

a focusing guide secured within, and electrically insulated from, said curved ion analyzer chamber inlet, said focusing guide having an aperture formed therein, wherein said focusing guide is configured to focus an ion beam passing through said curved ion analyzer chamber such that said ion beam exiting said focusing guide has less dispersion than said ion beam



entering said curved ion analyzer chamber inlet, and wherein collisions of ions with said curved ion analyzer chamber between said inlet and outlet are reduced; and

means for forming one of an electric field and a magnetic field around said focusing guide to focus said ion beam passing through said aperture.

6,040,583

ELECTRON BEAM EXPOSURE METHOD USING A MOVING STAGE

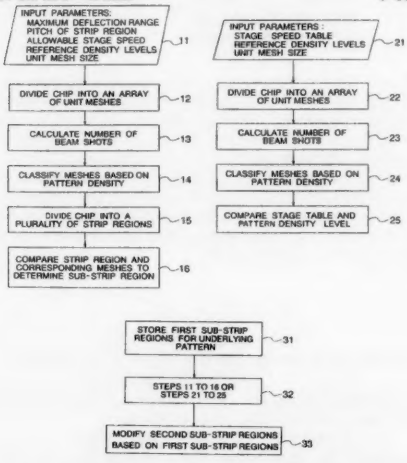
Naka Onoda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 22, 1998, Appl. No. 83,095

Claims priority, application Japan, May 22, 1997, 9-131539

Int. Cl.[7] **H01J** *37/302*

U.S. Cl. 250—492.22 **6 Claims**



1. An electron beam exposure method comprising the steps of:

dividing a semiconductor chip into a plurality of sub-strip regions each having a width equal to or lower than a maximum width determined by an electron beam deflection range, at least two of said sub-strip regions having different widths; and

consecutively exposing said plurality of sub-strip regions to form desired patterns on said semiconductor chip,

wherein each said sub-strip region is modified based on sub-strip regions used in exposure during exposure for underlying patterns.

6,040,584

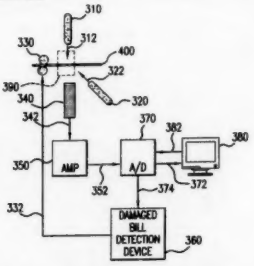
METHOD AND FOR SYSTEM FOR DETECTING DAMAGED BILLS

Jiancheng Liu, and Kazuo Yamazaki, both of Davis, Calif., assignors to MTI Corporation, Aurora, Ill.

Filed May 22, 1998, Appl. No. 83,138

Int. Cl.[7] **G01N** *21/86*

U.S. Cl. 250—559.11 **8 Claims**



1. A method for detecting an extent of deterioration of a bill, comprising:

generating at least one transmitted light image and at least one reflected light image of the bill;

determining at least one disorder curve length for at least some of the at least one transmitted light image and at least some of the at least one reflected light image;

determining at least one evaluation factor for at least some of the at least one transmitted light image and at least one evaluation factor for at least some of the at least one reflected light image based on the determined disorder curve lengths; and

determining the extent of deterioration of the bill based on at least some of the determined evaluation factors.

6,040,585

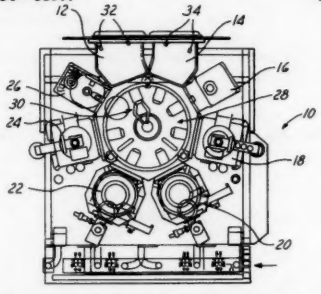
METHOD FOR DETECTING WAFER ORIENTATION DURING TRANSPORT

Yi Li Hsiao, Ta-Lin, Taiwan, assignor to Taiwan Semiconductor Manufacturing Co., Ltd, Hsin-chu, Taiwan

Filed Aug. 20, 1999, Appl. No. 379,134

Int. Cl.[7] **G01N** *21/86;* **C23C** *16/00;* **G01B** *11/14;* **B65G** *25/00;49/07*

U.S. Cl. 250—559.4 **20 Claims**



1. A method of controlling the operation of a semiconductor wafer transfer system of the type having a blade upon which a wafer is carried, and a robotic arm for transferring said blade between a plurality of chambers in a semiconductor processing system, comprising the steps of:

rotating said arm between each of a plurality of indexed positions respectively corresponding to said chambers;

shifting said arm between an extended, wafer transferring position, and a retracted, home position;

sensing by at least two laser beams and at least two receivers when said wafer is not in a preselected, desired position on said blade; and,

inhibiting rotation and shifting of said arm when the position of said wafer sensed in said sensing step is not said preselected position.

6,040,586

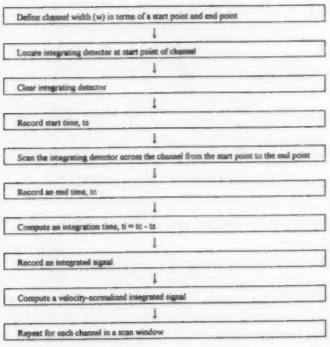
METHOD AND SYSTEM FOR VELOCITY-NORMALIZED POSITION-BASED SCANNING

Tor Slettnes, Oakland, Calif., assignor to The Perkin-Elmer Corporation, Foster City, Calif.

Filed May 5, 1998, Appl. No. 73,130

Int. Cl.[7] G01N *15/06*

U.S. Cl. 250—573 **25 Claims**


Define channel width (w) in terms of a start point and end point
Locate integrating detector at start point of channel
Clear integrating detector
Record start time, ts
Scan the integrating detector across the channel from the start point to the end point
Record an end time, te
Compute an integration time, ti = te - ts
Record an integrated signal
Compute a velocity-normalized integrated signal
Repeat for each channel in a scan window

1. A data collection method for scanning a scan window comprising one or more channels comprising the steps of:

detecting an integrated signal (S) across a scan window comprising one or more channels using an integrating detector; and

calculating a velocity-normalized integrated signal (Sn) as a function of a scan velocity and the integrated signal S.

6,040,587

SPIN-POLARIZED ELECTRON EMITTER HAVING SEMICONDUCTOR OPTO-ELECTRONIC LAYER WITH SPLIT VALENCE BAND

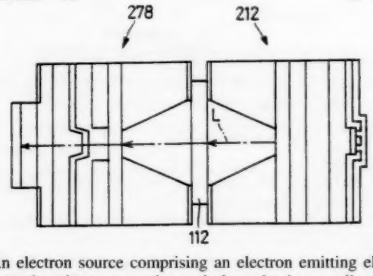
Katsumi Kishino, Yokohama, and Toshihiro Kato, Kasugai, both of Japan, assignors to Katsumi Kishino, Yokohama, and Daido Tokushuko Kabushiki Kaisha, Nagoya, both of Japan

Division of application No. 08/920,704, Aug. 29, 1997, abandoned, which is a continuation of application No. 08/124,624, Sep. 22, 1993, Pat. No. 5,747,862. This application Dec. 10, 1998, Appl. No. 208,861.

Claims priority, application Japan, Sep. 25, 1992, 4-280822; Oct. 22, 1992, 4-308259; Oct. 22, 1992, 4-308260

Int. Cl.[7] H01L *29/06*

U.S. Cl. 257—11 **13 Claims**



1. An electron source comprising an electron emitting element with a semiconductor opto-electronic layer having a split valence band, said opto-electronic layer emitting a beam of spin-polarized electrons from an emitting surface thereof upon incidence of an excitation laser radiation upon said opto-electronic layer, said electron source further comprising:

a semiconductor light modulating element disposed on one of opposite sides of said electron emitting element remote from said opto-electronic layer, said light modulating element including a pair of electrodes and modulating an intensity of the laser radiation to be incident upon said opto-electronic layer, such that said intensity varies with an amount of an electric current to be a=lied between said pair of electrodes.

6,040,588

SEMICONDUCTOR LIGHT-EMITTING DEVICE

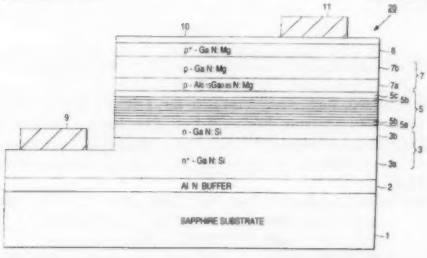
Norikatsu Koide; Shinya Asami; Junichi Umezaki; Masayoshi Koike; Shiro Yamasaki, and Seiji Nagai, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Filed Sep. 8, 1997, Appl. No. 925,325

Claims priority, application Japan, Sep. 8, 1996, 8-257819; Oct. 22, 1996, 8-299404

Int. Cl.[7] H01L *29/06;33/00*

U.S. Cl. 257—15 **10 Claims**



1. A semiconductor light-emitting device comprising:

a first semiconductor layer being made of n-type GaN;

a light-emitting layer of superlattice structure being formed on the first semiconductor layer by laminating a barrier layer being made of $In_{Y2}Ga_{1-Y1}N$ (Y1≧0) and a quantum well layer being made of $In_{Y2}Ga_{1-Y2}N$ (Y2>Y1 and Y2>0); and

a second semiconductor layer being made of p-type $Al_XGa_{1-X}N$ (0.05<X<0.2);

wherein layers being adjacent to the first semiconductor layer and the second semiconductor layer are the barrier layers in the light-emitting layer.

6,040,589

SEMICONDUCTOR DEVICE HAVING LARGER CONTACT HOLE AREA THAN AN AREA COVERED BY CONTACT ELECTRODE IN THE HOLE

Hongyong Zhang; Jun Koyama, and Satoshi Teramoto, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Jun. 12, 1997, Appl. No. 873,846

Claims priority, application Japan, Jun. 18, 1996, 8-178508; Oct. 8, 1996, 8-286001

Int. Cl.[7] H01L *21/312;29/04*

U.S. Cl. 257—59 **27 Claims**

1. A semiconductor device comprising:

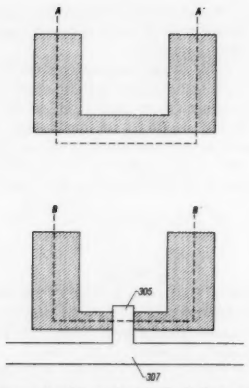
a semiconductor layer formed on an insulating surface;

an interlayer insulating film formed over said semiconductor layer;

a contact hole formed through said interlayer insulating film to expose a portion of said semiconductor layer therein;

an electrode formed on said interlayer insulating film and extending into said contact hole to electrically contact said semiconductor layer,

wherein said semiconductor layer and said electrode are patterned in said contact hole coextensively, and



wherein an area of said contact hole is larger than an area in which said electrode contacts the semiconductor layer.

6,040,590

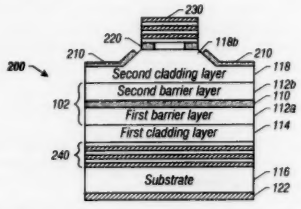
SEMICONDUCTOR DEVICE WITH ELECTROSTATIC CONTROL

John OBrien, Pasadena; Axel Scherer, Laguna Beach; Amnon Yariv, San Marino; Reginald Lee, Pasadena; Yuanjian Xu, Pasadena, and Oskar Painter, Pasadena, all of Calif., assignors to California Institute of Technology, Kanagawa-ken, Japan

Provisional application No. 60/032,660, Dec. 12, 1996. This application Dec. 12, 1997, Appl. No. 990,145.

Int. Cl.[7] **H01L** *33/00*

U.S. Cl. 257—94 **26 Claims**



1. A semiconductor device formed on a semiconductor substrate, comprising:

an active semiconductor medium layer responsive to a driving current across said active semiconductor medium layer to produce photons;

a first semiconductor cladding layer formed on a first side of said active semiconductor medium layer;

a second semiconductor cladding layer formed on a second opposing side of said active semiconductor medium layer, said first and second cladding layers operable to confine said photons within said active semiconductor medium layer;

first and second ohmic contacts respectively formed on said first side and second opposing side of said active semiconductor medium layer to supply said driving current;

an optical cavity formed to enclose at least a portion of said active semiconductor medium layer and having a cavity optic axis substantially perpendicular to said active semiconductor medium layer, said optical cavity controlling said photons to travel along said cavity optic axis; and

a plurality of control electrodes separate from one another and disposed relative to said active semiconductor medium layer, at least one control electrode biased at a first control potential and one control electrode biased at a second control potential to control a spatial distribution of said driving current in said active semiconductor medium layer such that said driving current has an elongated cross section profile to make a polarization of said photons along the elongation direction.

6,040,591

SOLID STATE IMAGING DEVICE HAVING REFRACTIVE INDEX ADJUSTING LAYER AND METHOD FOR MAKING SAME

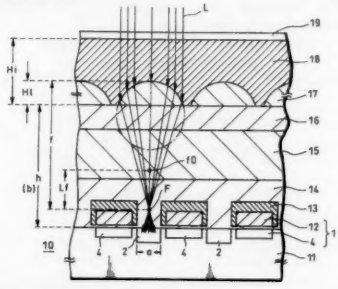
Youichi Otsuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 24, 1998, Appl. No. 46,766

Claims priority, application Japan, Mar. 25, 1997, 9-071886

Int. Cl.[7] **H01L** *27/148;29/768*

U.S. Cl. 257—232 **10 Claims**



1. A solid-state imaging device comprising:

a semiconductor substrate including at least one photosensor formed therein;

a first transparent flattening layer on the substrate and including formed therein transfer electrodes for the photosensor;

a color filter layer on the first transparent flattening layer;

a second transparent flattening layer on the color filter layer;

a microlens on the second the second transparent flattening layer in registry with the photosensor;

a refractive index adjusting layer formed over the microlens and the second transparent flattening layer, the refractive adjusting layer having a refractive index **n2** that is lower than refractive index **n1** of the microlens,

wherein,

a focal length f of the microlens as adjusted by the refractive index adjusting layer extends into the first transparent flattening layer and is expressed by the relationship $f=(n2)r/(n2-n1)$, where r is a radius of lens curvature of the microlens, and a top surface of the device is flat.

6,040,592

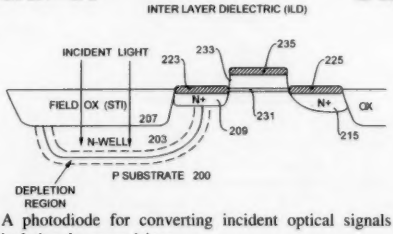
WELL TO SUBSTRATE PHOTODIODE FOR USE IN A CMOS SENSOR ON A SALICIDE PROCESS

Bart McDaniel, Phoenix; Mark A. Beiley, Chandler; Lawrence T. Clark, Phoenix; Eric J. Hoffman, and Edward J. Bawolek, both of Chandler, all of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 12, 1997, Appl. No. 873,987

Int. Cl.[7] **H01L** *31/068;31/0352*

U.S. Cl. 257—292 **23 Claims**



1. A photodiode for converting incident optical signals into electrical signals, comprising:

substrate layer of semiconductor material of a first conductivity type;

well of semiconductor material of a second conductivity type having a top and bottom, the bottom of the well being disposed in the substrate and a p-n junction defined there

between, the well and substrate defining a photosensitive region of said photodiode;

tap region of semiconductor material of the second conductivity type in contact with the well, the tap region having a greater dopant concentration than the well to promote electrical contact with the well; and

a field oxide region covering a substantial portion of the top of the well, the oxide region permitting the passage of at least some of the incident optical signals into the photosensitive region.

6,040,593

IMAGE SENSOR HAVING SELF-ALIGNED SILICIDE LAYER

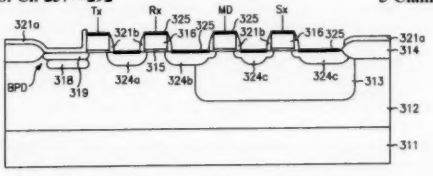
Sang Hoon Park, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jun. 29, 1999, Appl. No. 342,486

Claims priority, application Rep. of Korea, Jun. 29, 1998, 98-24648

Int. Cl.[7] **H01L** *27/108*

U.S. Cl. 257—292 **5 Claims**



1. A CMOS (Complementary Metal Oxide Semiconductor) image sensor, comprising:

a photo-sensing region, in which a buried photodiode is formed, for sensing light from an object;

a plurality of transistors electrically coupled to the buried photodiode;

silicide layers formed on gates and heavily doped regions of said pluralit of transistors except the photo-sensing region; and

a plurality of insulating layer patterns which are provided by patterning an insulating layer, wherein the insulating layer patterns include:

insulating spacers formed on sidewalls of the gates, which are respectively provided for the plurality of transistors; and

a passivation layer formed on the photo-sensing region and on a sidewall of neighboring one of the gates.

6,040,594

HIGH PERMITTIVITY ST THIN FILM AND A CAPACITOR FOR A SEMICONDUCTOR INTEGRATED CIRCUIT HAVING SUCH A THIN FILM

Seigen Otani, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

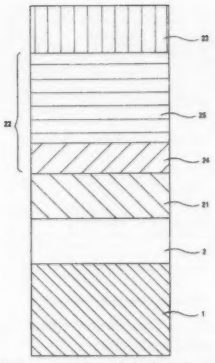
Division of application No. 08/429,169, Apr. 26, 1995, Pat. No. 5,882,946. This application Dec. 4, 1998, Appl. No. 205,398.

Claims priority, application Japan, Jul. 27, 1994, 6-175549

Int. Cl.[7] **H01L** *29/76;29/94;31/062;31/113;31/119*

U.S. Cl. 257—295 **6 Claims**

1. A high-permittivity thin film essentially consisting of strontium titanate ($SrTiO_3$) comprising a surface layer where concentration of titanium atoms is higher than that in a rest of the high-permittivity thin film.



6,040,595

STRUCTURE OF A NON-DESTRUCTIVE READOUT DYNAMIC RANDOM ACCESS MEMORY

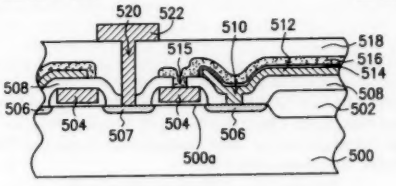
Yu-Hao Yang, Hsinchu Hsien, Taiwan, assignor to Winbond Electronics Corp., Hsinchu, Taiwan

Filed May 15, 1998, Appl. No. 80,131

Claims priority, application Taiwan, Mar. 13, 1998, 87103702

Int. Cl.[7] **H07L** *27/108*

U.S. Cl. 257—300 **15 Claims**



1. A structure of a circuit of a dynamic random access memory (DRAM), the structure of the circuit comprising:

a word line; wherein the word line supplies a voltage source;

a bit line;

a capacitor; wherein the capacitor in the DRAM is used for the storing a binary data and comprises a lower electrode and an upper electrode;

a field effect transistor (FET); wherein the FET comprises a gate being electrically coupled to the word line, a source region being electrically coupled to the bit line and a drain region being electrically coupled to the lower electrode of the capacitor; and

a coupling structure of the capacitor, wherein the upper electrode of the capacitor is electrically coupled to the word line.

6,040,596

DYNAMIC RANDOM ACCESS MEMORY DEVICES HAVING IMPROVED PERIPHERAL CIRCUIT RESISTORS THEREIN

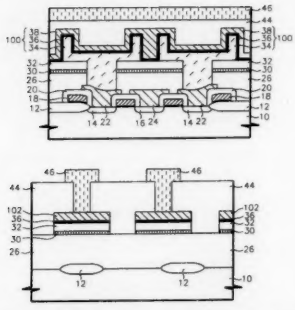
Chang-Shik Choi, and Young-Woo Park, both of Kyunggi-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 22, 1997, Appl. No. 897,365

Int. Cl.[7] **H01L** *27/108;29/76;29/94;29/00*

U.S. Cl. 257—306 **9 Claims**

1. A dynamic random access memory (DRAM) device having a memory cell array region and a peripheral circuit region at spaced apart locations in a semiconductor substrate, comprising:



an interlayer insulating layer having a planarized upper surface, on the semiconductor substrate;

a lower DRAM capacitor electrode on a first portion of the planarized upper surface of said interlayer insulating layer extending opposite the memory cell array region;

a capacitor dielectric layer having a first region therein that extends on said lower DRAM capacitor electrode and a second region therein that extends on a second portion of the planarized upper surface of said interlayer insulating layer;

an upper DRAM capacitor electrode on the first region of said capacitor dielectric layer, opposite said lower DRAM capacitor electrode; and

a resistor comprising the same material as said upper DRAM capacitor electrode and having a planar upper surface that extends opposite the second region of said capacitor dielectric layer.

6,040,597

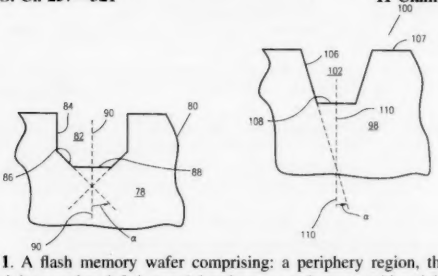
ISOLATION BOUNDARIES IN FLASH MEMORY CORES

Unsoon Kim, Santa Clara; Yowjuang W. Liu, San Jose, and Yu Sun, Saratoga, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 13, 1998, Appl. No. 23,166

Int. Cl.[7] **H01L** *29/788*

U.S. Cl. 257—321 **11 Claims**



1. A flash memory wafer comprising: a periphery region, the periphery region defining peripheral memory elements said peripheral memory elements being isolated from each other by an insulator region, said insulator region being formed using a LOCOS method;

a core memory region, the core memory region defining core memory elements;

isolation grooves separating the core memory elements from each other, at least some of the isolation grooves being V-shaped isolation grooves and being formed by a wet etching process such that said at least some of the V-shaped isolation grooves define respective axes and respective walls, and wherein at least a respective portion of each wall defines an angle of between twenty degrees and seventy degrees (20°–70°) relative to the respective axis to facilitate directing a dopant beam against the walls, and

a conductivity dopant implanted by said dopant beam into said respective walls, Said conductivity dopant being implanted in a parallel direction to said respective axes.

6,040,598

HIGH-BREAKDOWN-VOLTAGE SEMICONDUCTOR APPARATUS

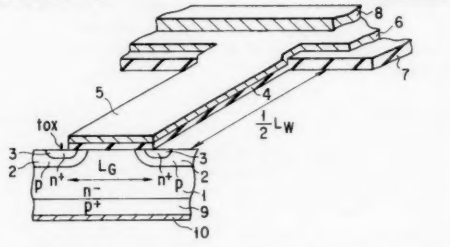
Kazuya Nakayama, Sagamihara, and Koichi Sugiyama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 17, 1998, Appl. No. 42,614

Claims priority, application Japan, Mar. 18, 1997, 9-065146; Mar. 10, 1998, 10-057956

Int. Cl.[7] **H01L** *29/76*

U.S. Cl. 257—329 **12 Claims**



1. A high-breakdown-voltage semiconductor apparatus comprising:

a first-conductity-type base layer;

a second-conductivity-type base layer formed on a surface of the first-conductivity-type base layer;

a first-conductivity-type source layer formed on a surface of the second-conductivity-type base layer;

a gate electrode provided over that portion of the second-conductivity-type base layer, which is interposed between the first-conductivity-type source layer and the first-conductivity-type base layer, with a gate insulation film interposed between the gate electrode and the interposed portion of the second-conductivity-type base layer;

a second-conductivity-type drain layer formed on a surface of the first-conductivity-type base layer, which is opposed to the surface thereof on which the second-conductivity-type base layer;

a drain electrode put in contact with the second-conductivity-type drain layer; and

a source electrode put in contact with the first-conductivity-type source layer and the second-conductivity-type base layer,

wherein when a gate capacitance of that portion of the gate electrode, under which a channel is formed, is Cg [F],

a resistance in a channel length direction of that portion of the gate electrode, under which the channel is formed, is Rg [Ω],

a threshold voltage, which is to be applied to the gate electrode and application of which permits flow of a drain current, is Vth [V],

a voltage to be applied to the gate electrode to cut off the drain current is Voff [V], and

a ratio of increase in the drain voltage per unit time at the time of cutting off the drain current is dV/dt [V/s],

the following condition is satisfied:

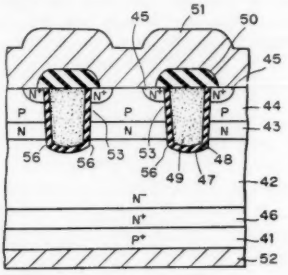
$$|Vth-Voff| \geqq 0.5 \cdot Cg \cdot Rg \cdot (dV/dt)$$

6,040,599

INSULATED TRENCH SEMICONDUCTOR DEVICE WITH PARTICULAR LAYER STRUCTURE

Hideki Takahashi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1996, Appl. No. 721,576
Claims priority, application Japan, Mar. 12, 1996, 8-054656
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H01L *29/76;27/108;29/74*
U.S. Cl. 257—330 **15 Claims**



1. An insulated gate semiconductor device, comprising:
- a first semiconductor layer of a first conductivity type having first and second main surfaces
- a second semiconductor layer of a second conductivity type provided over the first main surface of said first semiconductor layer;
- a third semiconductor layer of the second conductivity type provided in close contact on a surface of said second semiconductor layer and having an impurity concentration higher than the impurity concentration of said second semiconductor layer;
- a fourth semiconductor layer of the first conductivity type provided in close contact on a surface of said third semiconductor layer;
- a fifth semiconductor layer of the second conductivity type selectively provided in a surface of said fourth semiconductor layer;
- a trench having an opening in a surface of said fifth semiconductor layer and having a depth extending through at least said fourth semiconductor layer from the surface of said fifth semiconductor layer;
- an insulating film provided on an inner entire wall of said trench;
- a control electrode provided in said trench to face said fourth semiconductor layer through said insulating film;
- a first main electrode provided on the surface of said fourth and fifth semiconductor layers; and
- a second main electrode provided on the second main surface of said first semiconductor layer, wherein said second semiconductor layer is thicker than said third semiconductor layer.

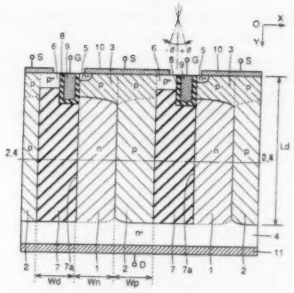
6,040,600

TRENCHED HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Akio Uenishi, and Tadaharu Minato, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1997, Appl. No. 909,411
Claims priority, application Japan, Feb. 10, 1997, 9-026997
Int. Cl.[7] H01L *29/78*
U.S. Cl. 257—330 **20 Claims**

1. A high breakdown voltage semiconductor device comprising:
- a semiconductor substrate having first and second main surfaces opposite to each other and also having a plurality of trenches provided at said first main surface;
- a first impurity region of a first conductivity type formed within a region of said semiconductor substrate sandwiched between one and another trenches of said plurality of trenches at a sidewall surface of said one trench;



- a second impurity region of a second conductivity type formed within said region sandwiched between said one and another trenches at a sidewall surface of said another trench, and forming a pn junction together with said first impurity region;
- a third impurity region of the second conductivity type formed closer to said first main surface than said first and second impurity regions;
- a fourth impurity region of the first conductivity type formed on at least one of said first main surface and a sidewall surface of said one trench such that said fourth impurity region is disposed opposite to said first impurity region with said third impurity region disposed therebetween; and
- a gate electrode layer opposite to said third impurity region, sandwiched between said first and fourth impurity regions, with a gate insulating layer disposed therebetween;

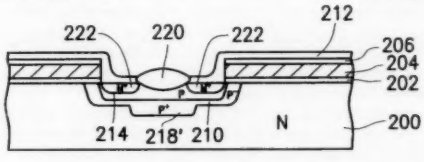
wherein
- said first impurity region has a distribution of concentration of an impurity diffused from a sidewall surface of said one trench; and
- said second impurity region has a distribution of concentration of an impurity diffused from a sidewall surface of said another trench.

6,040,601

HIGH VOLTAGE DEVICE

Jeng Gong, and Sheng-Hsing Yang, both of Hsinchu, Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed May 27, 1998, Appl. No. 85,681
Claims priority, application Taiwan, Apr. 3, 1998, 87105065
Int. Cl.[7] H01L *29/72*
U.S. Cl. 257—341 **20 Claims**



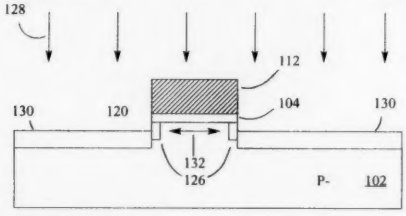
1. A high voltage device, wherein a semiconductor substrate having at least a gate formed thereon is provided, the high voltage device comprising:
- a first diffusion in the semiconductor substrate, wherein the first diffusion region has an edge portion extending under an edge portion of the gate;
- a second diffusion region within the first diffusion region, wherein the second diffusion region is exposed by the gate;
- a third diffusion region extending downward from a central portion of the first diffusion region under the second diffusion region;
- a field oxide layer on a part of the second diffusion region over the third diffusion region; and
- a source/drain region under a surface of the second diffusion region between the field oxide layer and the gate.

6,040,602

FORMATION OF LIGHTLY DOPED REGIONS UNDER A GATE

H. James Fulford, Austin, and Mark I. Gardner, Cedar Creek, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1997, Appl. No. 993,919
Int. Cl.[7] H01L *29/76*
U.S. Cl. 257—344 **10 Claims**



1. A device comprising:

a gate over a semiconductor substrate;

at least one lightly doped region within the substrate substantially underneath the gate, said lightly doped region having a side wall oriented perpendicular to the substrate, a portion of said side wall extending above the surface of the substrate;

at least one heavily doped region within the substrate adjacent to the gate; and

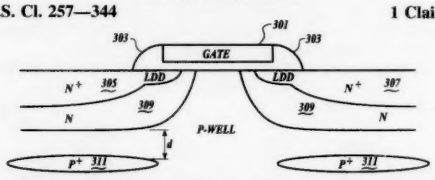
a gate oxide layer over said lightly doped region, not extending substantially beyond said portion of the side wall of the lightly doped region.

6,040,603

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT EMPLOYING MOSFETS HAVING DOUBLE ESD IMPLANTATIONS

Jiuun-Jer Yang, Chin-Men Hsien, Taiwan, assignor to Worldwide Semiconductor Manufacturing Corporation, Chin-Men Hsien, Taiwan

Filed Apr. 30, 1999, Appl. No. 303,769
Int. Cl.[7] H01L *21/336*
U.S. Cl. 257—344 **1 Claim**



1. A transistor formed in a semiconductor substrate having improved FSD protection comprising:

a gate structure formed atop of said semiconductor substrate, said gate structure comprised of a conducting layer formed atop a thin gate oxide layer;

sidewall spacers formed on the sidewalls of said gate structure;

lightly doped source and drain regions formed in said semiconductor substrate and substantially underneath said sidewall spacers;

a source region formed in said semiconductor substrate and adjacent to one of said sidewall spacers;

a drain region formed in said semiconductor substrate and adjacent to a second one of said sidewall spacers:

a first ESD implant formed underneath said source region and said drain region, said first ESD implant having the same impurity type as said source region and said drain region;

wherein said source region, said drain region, and said lightly doped drain regions are within said first ESD implant; and

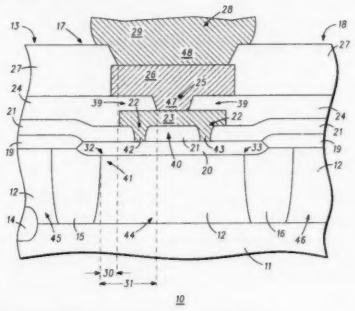
a second ESD implant formed underneath said first ESD implant, said second ESD implant having an impurity type opposite to that of said first ESD implant, said second ESD implant also being spaced apart vertically from said first ESD implant.

6,040,604

SEMICONDUCTOR COMPONENT COMPRISING AN ELECTROSTATIC-DISCHARGE PROTECTION DEVICE

Olivier J. Lauvray, Chandler, and David Rodriguez, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 21, 1997, Appl. No. 897,964
Int. Cl.[7] H01L *21/44*
U.S. Cl. 257—355 **9 Claims**



1. A semiconductor component comprising:

a substrate;

a first doped region in the substrate;

an electrostatic-discharge protection device in the substrate comprising a second doped region in the substrate wherein a first portion of the second doped region contacts the first doped region at a first portion of the substrate;

a first interconnect layer overlying the electrostatic-discharge protection device, wherein a ring-shaped portion of the first interconnect layer overlies and contacts a second portion of the second doped region;

a second interconnect layer overlying the first interconnect layer and the electrostatic-discharge protection device, wherein a portion of the second interconnect layer overlies and contacts the first interconnect layer, overlies the electrostatic-discharge protection device, is devoid of overlying the ring-shaped portion of the first interconnect layer, and is devoid of overlying the first and second portions of the second doped region; and

a third interconnect layer overlying the first and second interconnect layers and the electrostatic-discharge protection device, wherein a portion of the third interconnect layer overlies and contacts the second interconnect layer, overlies the electrostatic-discharge protection device, and overlies the portions of the first and second interconnect layers.

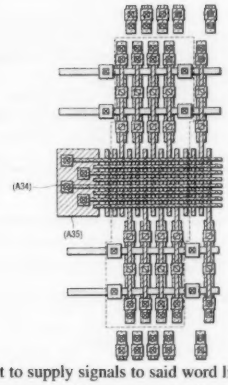
6,040,605

SEMICONDUCTOR MEMORY DEVICE

Toshiaki Sano, Tachikawa; Tomoyuki Ishii, Hachioji; Kazuo Yano, Hino, and Toshiyuki Mine, Fussa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of application No. 09/126,437, Jul. 30, 1998. This application Jan. 26, 1999, Appl. No. 236,630.
Claims priority, application Japan, Jan. 28, 1998, 10-015369
Int. Cl.[7] H01L *29/76;29/94;31/062;31/113*
U.S. Cl. 257—369 **34 Claims**

1. A semiconductor memory device having memory cell blocks each comprised of a plurality of memory cells positioned at the cross points of intersecting word lines and data lines, and a



peripheral circuit to supply signals to said word lines and said data lines; and said memory cell being comprised of a substrate, a first area laminated on said substrate, an insulating film, a second area,

a channel region interconnecting said first area and said second area, a gate electrode for applying an electrical field to said channel region, and an electric charge trap area and wherein information storage is performed by changing the semiconductor threshold voltage by controlling the quantity of carriers in said electric charge trap area and wherein at least a portion of said peripheral circuit is a CMOS circuit comprised of nMOS transistors and pMOS transistors.

6,040,606

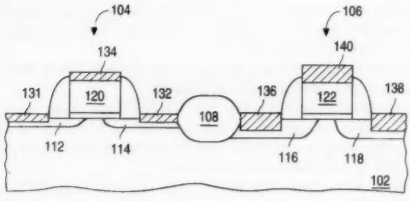
INTEGRATED CIRCUIT STRUCTURE WITH DUAL THICKNESS COBALT SILICIDE LAYERS AND METHOD FOR ITS MANUFACTURE

Christopher S. Blair, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 4, 1998, Appl. No. 187,306

Int. Cl.[7] **H01L** *29/78;27/085;29/45*

U.S. Cl. 257—384 **3 Claims**



1. An IC structure with dual thickness cobalt silicide layers, the IC structure comprising:

a plurality of first MOS transistor structures with shallow source and drain regions and polysilicon gates;

a plurality of second MOS transistor structures with deep source and drain regions and polysilicon gates;

thin cobalt silicide ($CoSi_2$) layers on the first MOS transistor structures; and

thick cobalt silicide ($CoSi_2$) layers on the second MOS transistor structures.

6,040,607

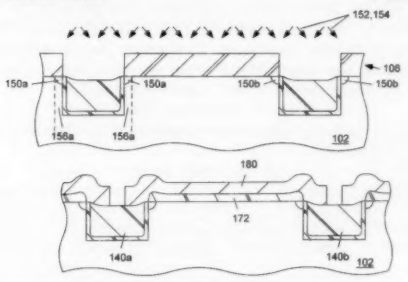
SELF ALIGNED METHOD FOR DIFFERENTIAL OXIDATION RATE AT SHALLOW TRENCH ISOLATION EDGE

Derick J. Wristers; H. Jim Fulford, both of Austin, and Mark I. Gardner, Cedar Creek, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 23, 1998, Appl. No. 928,607

Int. Cl.[7] **H01L** *27/02;29/68*

U.S. Cl. 257—389 **4 Claims**



1. An integrated circuit comprising:

a semiconductor substrate, wherein said semiconductor substrate includes at least one isolation region;

at least one isolation structure, wherein said isolation structure comprises an isolation dielectric contained within an isolation trench formed within said isolation region of said semiconductor substrate; and

a gate dielectric formed on an upper surface of said semiconductor substrate, wherein said semiconductor substrate includes an oxygen bearing impurity distribution in portions of said semiconductor substrate proximal to said isolation structure, and further wherein a first thickness of said gate dielectric over regions of said proximal portions of said semiconductor substrate is greater than a second thickness of said gate dielectric over portions of said semiconductor substrate distal from said isolation structure, and wherein said proximal portions of said semiconductor substrate are only within approximately 200 angstroms of said isolation structure.

6,040,608

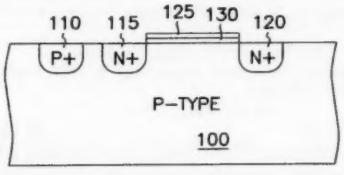
FIELD-EFFECT TRANSISTOR FOR ONE-TIME PROGRAMMABLE NONVOLATILE MEMORY ELEMENT

Manny K. F. Ma; Rajesh Somasekharan, and Wen Li, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of application No. 08/652,376, May 23, 1996, Pat. No. 5,834,813. This application Nov. 4, 1997, Appl. No. 964,164.

Int. Cl.[7] **H01L** *29/68*

U.S. Cl. 257—390 **40 Claims**



1. An integrated circuit programmed nonvolatile memory element comprising:

a field-effect transistor (FET) having drain and source terminals, an electrically interconnected gate terminal that is substantially adjacent to the substrate and separated therefrom by an insulator, and a body terminal, wherein the FET has been programmed such that a channel region has a crystalline

lattice stricture which has been permanently altered by temporarily applying a differential drain-to-source programming voltage that exceeds a characteristic drain-to-source avalanche breakdown voltage magnitude (Bvdss).

6,040,609

PROCESS FOR INTEGRATING, IN A SINGLE SEMICONDUCTOR CHIP, MOS TECHNOLOGY DEVICES WITH DIFFERENT THRESHOLD VOLTAGES

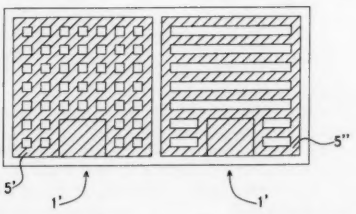
Ferruccio Frisina, Sant'Agata Li Battiati; Davide Bolognesi, Argenta, and Argelo Magri', Belpasso, all of Italy, assignors to STMicroelectronics S.r.l., Agrate Brianza, Italy

Filed Oct. 23, 1998, Appl. No. 178,369

Claims priority, application European Pat. Off., Oct. 24, 1997, 97830543

Int. Cl.[7] **H01L** *29/76*

U.S. Cl. 257—391 **18 Claims**



1. A process for integrating in a same MOS technology devices with different threshold voltages, comprising:

simultaneously forming on a semiconductor material layer of at least two gate electrodes for at least two MOS devices, said gate electrodes comprising substantially rectilinear portions and corners, each gate electrode having a respective corner density per unit area; and

selectively introducing in the semiconductor material layer a dopant for the simultaneous formation of respective channel regions for said at least two MOS devices, said channel regions extending under the respective gate electrode, said selective introduction using as a mask the respective gate electrodes so that said channel regions have, at the corners of the respective gate electrode, a dopant concentration lower than that at the substantially rectilinear portions, and said two MOS devices consequently have respective threshold voltages that depend on the corner density per unit area and on the aperture angles of the corner of the respective gate electrodes.

6,040,610

SEMICONDUCTOR DEVICE

Mitsuhiro Noguchi, and Yukihito Oowaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 8, 1998, Appl. No. 56,632

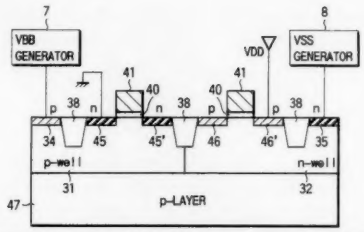
Claims priority, application Japan, Apr. 8, 1997, 9-089538; Jan. 14, 1998, 10-005986

Int. Cl.[7] **H01L** *29/72*

U.S. Cl. 257—392 **25 Claims**

1. A semiconductor device comprising: a chip including a MISFET having a source and a drain, in which one of the source and the drain is connected to a second current supply node; an impedance element having a first terminal connected to the other of the source and the drain and a second terminal connected to a first current supply node; and a switching element, wherein

a well or a body electrode of the MISFET has an active state and a standby state, and is connected to a bias voltage generator for generating different voltages through the switching element,



the threshold voltage V_{ths} during standby state of the MISFET is higher than the threshold voltage V_{tha} during active state of the MISFET,

a voltage applied to a gate of the MISFET being able to take two stationary values, and

the following relationship is satisfied:

$$V_{DD}(1-V_{ths}/V_{DD})<V_{ths}-V_{tha}$$

where V_{DD} represents the higher voltage among the two stationary values.

6,040,611

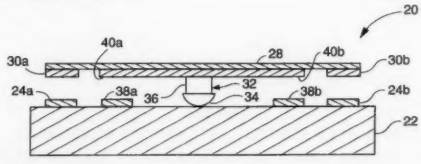
MICROELECTROMECHANICAL DEVICE

Hector J. De Los Santos, Inglewood; Yu-Hua Kao, Los Angeles; Arturo L. Caigoy, Chino Hills, and Eric D. Ditmars, Redondo Beach, all of Calif., assignors to Hughes Electonics Corporation, Los Angeles, Calif.

Filed Sep. 10, 1998, Appl. No. 150,901

Int. Cl.[7] **H01L** *27/14;29/82;29/84*

U.S. Cl. 257—415 **15 Claims**



1. A microelectromechanical, MEM, device comprising:

a substrate having:

a first interconnection line;

a second interconnection line being parallel to the first interconnection line; and

a first and second primary control electrode wherein the first primary control electrode is positioned on one side of the first interconnection line and wherein the second primary control electrode is positioned on the other side of the second interconnection line;

a flexible cantilever beam having a top surface and a bottom surface and a beam width and having:

a flexible anchor secured to the bottom surface of the beam at a center of the beam and attached to a center of the substrate so as to position the beam orthogonally to the first and second interconnection lines;

a first and second secondary control electrode secured to the bottom surface of the beam and positioned opposite the first and

second primary control electrode said

a first and second contact pad secured to the bottom surface of the beam and positioned opposite the first and second interconnection lines wherein said first contact pad and said first interconnection line define a first gap having a first gap width, and said second contact pad and said second interconnection line define a second gap having a second gap width, and wherein said flexible cantilever beam has a beam width larger than said first and second gap widths at a first and second portion corresponding to the first and second interconnection lines; and

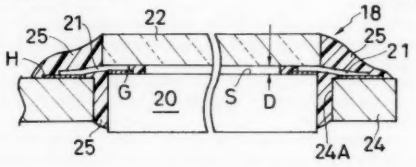
wherein when a voltage is applied to one of the first and second primary control electrodes and the corresponding one of the first and second secondary control electrodes the beam will move towards one of the first and second primary control electrodes causing one of the first and second contact pads to overlap the corresponding one of the first and second gaps so as to make an electrical connection between the corresponding one of the first and second interconnection lines.

6,040,612

IMAGE PICKUP APPARATUS FOR ENDOSCOPE HAVING REDUCED DIAMETER

Itsuji Minami, and Kazuaki Takahashi, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Jan. 27, 1998, Appl. No. 13,934
Claims priority, application Japan, Feb. 7, 1997, 9-039936
Int. Cl.[7] H01L *31/0232*
U.S. Cl. 257—432 **4 Claims**



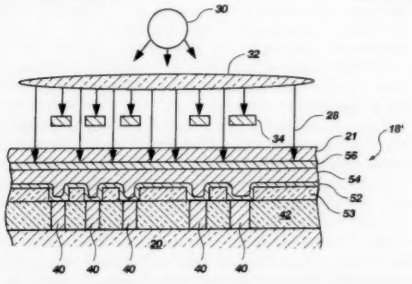
1. An image pickup apparatus for an endoscope comprising:
a circuit board having a through hole aperture and at least one terminal;
an image pickup device body having at least one terminal on an image plane pickup side, and an outer periphery;
a conductor lead connected to the terminal of the image pickup device and protruding from the outer periphery;
an optical element attached to the image plane pickup side of the image pickup device body by a sealant;
an airtight air gap formed between the image pickup device, image pickup plane and the optical element;
wherein the image pickup device body is inside the circuit board through hole aperture; and
wherein the conductor lead is a tape automated bond lead.

6,040,613

ANTIREFLECTIVE COATING AND WIRING LINE STACK

Everett A. McTeer; Russell C. Zahorik, and Scott G. Meikle, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 19, 1996, Appl. No. 588,738
Int. Cl.[7] H01L *31/0232*
U.S. Cl. 257—437 **13 Claims**



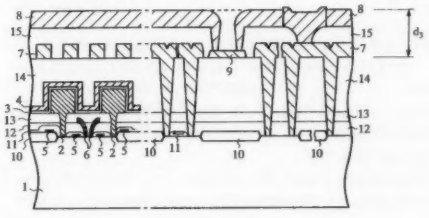
1. An antireflective coating for a semiconductor substrate, the coating comprising a layer, the layer formed of titanium, aluminum, and nitrogen, wherein the substrate is part of a field emission display device, the field emission display device further comprising a display screen,
wherein the substrate comprises: a plurality of emitter sites and a display transistor, the plurality of emitter sites coupled to a source of the display transistor;
wherein the coating shields display transistor junctions from photons emitted by the display surface and from an ambient environment of the field emission display device; and
wherein said antireflective coating contains between about 10 and 90 percent aluminum by weight.

6,040,614

SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING A CAPACITOR AND A FUSE ELEMENT

Akira Kitaguchi; Makoto Hatakenaka; Michio Nakajima; Kaoru Motonami, all of Tokyo; Kiyoyuki Shiroshima, Hyogo, and Takekazu Yamashita, Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric System LSI Design Corporation, Hyogo, both of Japan

Filed Mar. 3, 1998, Appl. No. 33,611
Claims priority, application Japan, Sep. 2, 1997, 9-237391
Int. Cl.[7] H01L *29/40*
U.S. Cl. 257—529 **5 Claims**



1. A semiconductor integrated circuit comprising:
a semiconductor substrate;
a capacitor disposed on said semiconductor substrate;
an insulating layer disposed on said capacitor and on said semiconductor substrate, said insulating layer having a substantially planar surface smoothed by chemical mechanical polishing; and
a fuse element disposed on the substantially planar surface of said insulating layer.

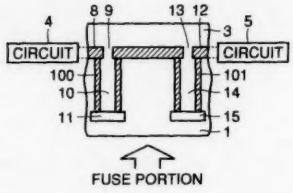
6,040,615

SEMICONDUCTOR DEVICE WITH MOISTURE RESISTANT FUSE PORTION

Yukihiro Nagai, and Tomoharu Mametani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1998, Appl. No. 59,280
Claims priority, application Japan, Nov. 20, 1997, 9-319447
Int. Cl.[7] H01L *29/00;23/58;23/62*
U.S. Cl. 257—529 **6 Claims**

1. A semiconductor device, comprising:
a semiconductor substrate;
a first circuit and a second circuit with a space therebetween, provided on said semiconductor substrate;
a fuse provided on said semiconductor substrate between said first circuit and said second circuit;
a first metal portion provided on said semiconductor substrate having one end connected to said first circuit;
a first trench provided in a main surface of said semiconductor substrate between said fuse and said first metal portion;
a first doped layer formed at a bottom of said first trench;



a first plug provided at a sidewall surface of said first trench to electrically connect another end of said first metal portion with said first doped layer;

a second plug provided at the sidewall surface of said first trench, spaced apart from said first plug, to electrically connect one end of said fuse with said first doped layer; and

an insulating film provided on said semiconductor surface to fill in said first trench.

6,040,616

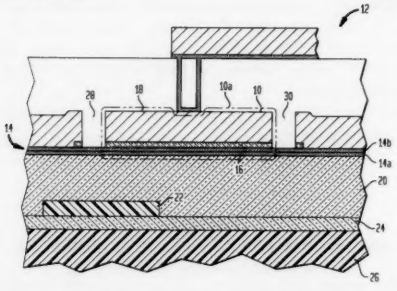
DEVICE AND METHOD OF FORMING A METAL TO METAL CAPACITOR WITHIN AN INTEGRATED CIRCUIT

Donald C. Dennis; Joseph R. Radosevich, and Ranbir Singh, all of Orlando, Fla., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of application No. 08/472,033, Jun. 6, 1995, Pat. No. 5,654,581. This application Aug. 12, 1997, Appl. No. 909,563.

Int. Cl.[7] **H01L** *29/00*

U.S. Cl. 257—535 **10 Claims**



1. For use in an integrated circuit structure having a prior level that includes a foundation dielectric, a capacitor comprising:

substantially planar first and second electrodes having a capacitor dielectric formed there between, said first electrode formed immediately over said prior level and a portion of said first electrode overlapping said second electrode to define a common area, said first electrode:

extending beyond said common area, and

connecting said capacitor to said prior level outside said common area; and

a contact metal located on the same level as and in close proximity to said capacitor and on a portion of said first electrode that extends beyond said common area, thereby to improve a circuit packing density of said integrated circuit structure.

6,040,617

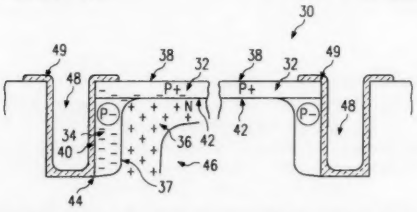
STRUCTURE TO PROVIDE JUNCTION BREAKDOWN STABILITY FOR DEEP TRENCH DEVICES

Viren C. Patel, Belle Meade, N.J., assignor to STMicroelectronics, Inc., Carrollton, Tex.

Filed Dec. 22, 1992, Appl. No. 995,582

Int. Cl.[7] **H01L** *27/082;29/861;23/58;29/00*

U.S. Cl. 257—571 **16 Claims**



1. A deep trench transistor structure which provides junction breakdown stability, comprising:

a base region;

a collector region surrounded by a buffer region, wherein the base region rests on top of the buffer region and the collector region;

a deep trench having at least two vertical sidewalls and a floor, wherein the base region extends to a vertical sidewall of the deep trench; and

a base-collector junction connecting the base region and the collector region, wherein the buffer region is located adjacent to the vertical sidewall, thereby shifting the base-collector junction towards the collector region and away from the vertical sidewall.

6,040,618

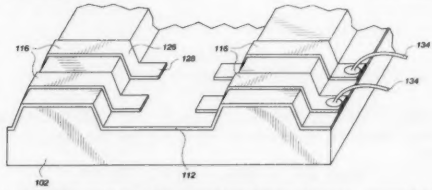
MULTI-CHIP MODULE EMPLOYING A CARRIER SUBSTRATE WITH MICROMACHINED ALIGNMENT STRUCTURES AND METHOD OF FORMING

Salman Akram, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Mar. 6, 1997, Appl. No. 812,476

Int. Cl.[7] **H01L** *27/082;27/102;29/70;31/11*

U.S. Cl. 257—586 **35 Claims**



1. A carrier substrate for a semiconductor element, comprising:

a substrate with a substantially planar surface having at least one elongated, substantially linear mesa defined by two inclined sidewalls rising therefrom and extending to a top surface substantially parallel to said substantially planar surface;

an insulating layer disposed over said substantially planar substrate surface and said at least one elongated substantially linear mesa; and

a plurality of conductive traces extending over said insulating layer and including mutually parallel, laterally spaced, substantially linear segments oriented transversely to said at least one elongated, substantially linear mesa, said mutually parallel, laterally spaced, substantially linear segments of said plurality of conductive traces each extending over a first portion of said planar substrate surface on one side of said at least one elongated mesa, over said at least one elongated, substantially linear mesa and onto a second portion of said substantially planar substrate surface on an opposing side of said at least one elongated, substantially linear mesa.

6,040,619

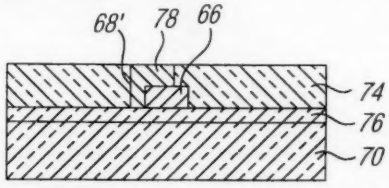
SEMICONDUCTOR DEVICE INCLUDING ANTIREFLECTIVE ETCH STOP LAYER

Fei Wang; David K. Foote, both of San Jose; Myron R. Cagan, Saratoga, and Subhash Gupta, San Jose, all of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Continuation-in-part of application No. 08/479,718, Jun. 7, 1995, Pat. No. 5,710,067. This application Sep. 25, 1997, Appl. No. 937,774.

Int. Cl.[7] **H01L** *23/58;21/316;23/48*

U.S. Cl. 257—649 **10 Claims**



1. A semiconductor structure, comprising:

a semiconductor substrate;

a semiconductor device formed on a surface of the substrate; and

a layer of silicon oxime formed over the surface of the substrate and the device, the layer having a silicon content of approximately 40% to 50% by weight and a thickness of approximately 800 Å±10%.

6,040,620

LEAD FRAME FOR LOC HAVING A REGULATING LEAD TO PREVENT VARIATION IN ADHESIVE COVERAGE

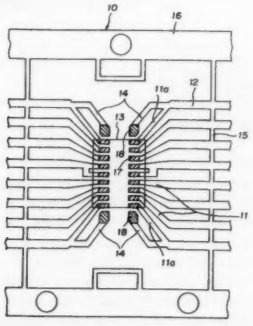
Hiroshi Sugimoto; Shigeo Hagiya; Noriaki Taketani; Takaharu Yonemoto, and Osamu Yoshioka, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Jul. 3, 1997, Appl. No. 888,121

Claims priority, application Japan, Jul. 5, 1996, 8-176114; Jul. 5, 1996, 8-176115

Int. Cl.[7] **H01L** *23/495*

U.S. Cl. 257—666 **4 Claims**



1. A lead frame for LOC, comprising:

a plurality of inner leads for mounting a semiconductor chip at front ends thereof;

an insulating adhesive material for fixing a semiconductor chip on said plurality of inner leads, said insulating adhesive material being coated on a portion of said plurality of inner leads located within a semiconductor chip mounting region; and

an additional lead for regulating coverage of said insulating adhesive material, said additional lead being located outside said semiconductor chip mounting region and adjacent to one of said plurality of inner leads which is located in an outermost position in said semiconductor chip mounting region;

said additional lead being coated at a front end thereof with said insulating adhesive material.

6,040,621

SEMICONDUCTOR DEVICE AND WIRING BODY

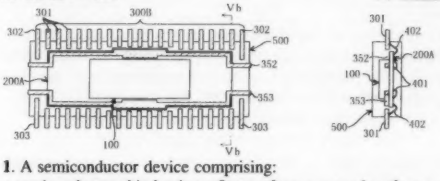
Sachiyuki Nose, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 23, 1998, Appl. No. 45,832

Claims priority, application Japan, Mar. 26, 1997, 9-073142

Int. Cl.[7] **H01L** *23/495;23/48;23/52*

U.S. Cl. 257—666 **50 Claims**



1. A semiconductor device comprising:

a semiconductor chip having a first surface, a second surface and plural bonding pads on said first surface;

a wiring body including a plate-shaped insulating supporting substrate and plural lines supported by said insulating supporting substrate, said wiring body being mounted on said first surface of said semiconductor chip;

a bonding member for electrically connecting said bonding pads of said semiconductor chip with a part of each of said plural lines of said wiring body; and

plural leads connected with another part of each of said plural lines of said wiring body,

wherein said plural lines include a signal line, a power line and a ground line,

said plural leads include a signal lead, a power lead and a ground lead, and

said signal line is electrically connected with said signal lead, said power line is electrically connected with said power lead, and said ground line is electrically connected with said ground lead.

6,040,622

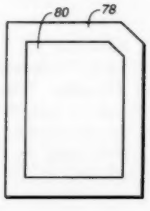
SEMICONDUCTOR PACKAGE USING TERMINALS FORMED ON A CONDUCTIVE LAYER OF A CIRCUIT BOARD

Robert F. Wallace, Sunnyvale, Calif., assignor to SanDisk Corporation, Sunnyvale, Calif.

Filed Jun. 11, 1998, Appl. No. 96,140

Int. Cl.[7] **H01L** *23/02*

U.S. Cl. 257—679 **26 Claims**



1. A package including:

a circuit board;

an set of circuit elements on the circuit board, the set of circuit elements including at least one integrated circuit and passive components; and

packaging material surrounding the set of circuit elements and part of the circuit board,

wherein one side of the circuit board includes a set of terminals that are visible from the side of the package, the set of terminals being positioned away from the edge of the circuit board, and

wherein the package is a flash EEPROM package.

6,040,623

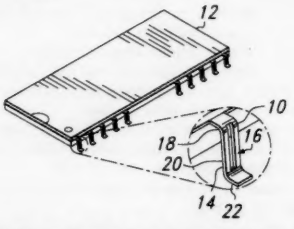
SLOTTED LEAD FOR A SEMICONDUCTOR DEVICE

Min Yu Chan, and Jing Sua Goh, both of Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application No. 08/476,958, Jun. 7, 1995, abandoned, which is a division of application No. 08/232,975, Apr. 25, 1994, abandoned, which is a continuation of application No. 08/565,224, Nov. 30, 1995, Pat. No. 5,647,124. This application Feb. 5, 1997, Appl. No. 795,056.

Int. Cl.[7] **H01L** *23/495;23/48;23/52*

U.S. Cl. 257—692 **6 Claims**



1. A lead disposed to connect a semiconductor device to a surface, comprising:

a plurality of discrete, independent electrically conductive lead fingers, each of said lead fingers having a first substantially horizontal segment connectable to a semiconductor device, a substantially vertical segment connected to said first substantially horizontal segment, and a second substantially horizontal segment connected to said substantially vertical segment; and

at least one slot formed in at least said substantially vertical segment, said slot dividing said vertical segment into at least two substantially parallel vertically oriented leg segments that are connected at first and second slot ends, respectively, formed in the lead finger, whereby said slot is fully positioned external of the semiconductor device, thereby inhibiting contamination flow alone the lead fingers into the semiconductor device.

6,040,624

SEMICONDUCTOR DEVICE PACKAGE AND METHOD

Benjamin C. Chambers, Chandler; William R. Blood, Jr., Fountain Hills, and Tien-Yu T. Lee, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

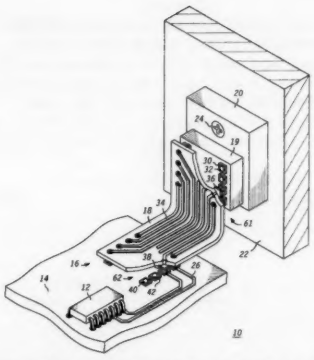
Filed Oct. 2, 1997, Appl. No. 943,020

Int. Cl.[7] **H01L** *23/48*

U.S. Cl. 257—692 **4 Claims**

1. A semiconductor package, comprising:

a flexible substrate having a plurality of conductors routed along the flexible substrate between a mounting region of the flexible substrate and a terminal region of the flexible substrate wherein the mounting region is physically separated a distance of at least 2.0 millimeters from the terminal region to thermally isolate the mounting region and the terminal region; and



a heat generating semiconductor device having a first surface disposed on the mounting region of the flexible substrate, where the heat generating semiconductor device is mountable to a heat dissipating surface for dissipating the heat generated by the semiconductor device.

6,040,625

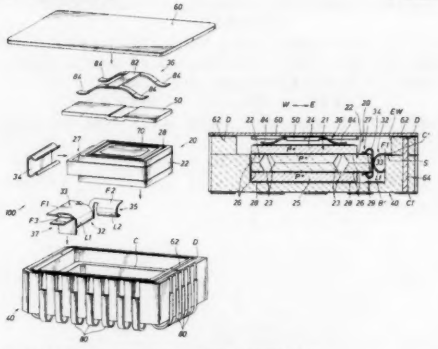
SENSOR PACKAGE ARRANGEMENT

Matthew W. Ip, Austin, Tex., assignor to I/O Sensors, Inc., Austin, Tex.

Filed Sep. 25, 1997, Appl. No. 935,093

Int. Cl.[7] **H01L** *23/34*

U.S. Cl. 257—719 **8 Claims**



1. A sensor-package arrangement comprising,

a case of insulating material, said case having walls which define an internal cavity, said cavity having at least one internal surface with conductive material thereon and having a conductive channel placed in one of said walls between an external conductive contact on the exterior of said case and said conductive material of said internal surface,

a sensor die disposed between walls in said cavity of said case, said sensor die having at least one die electrical contact,

an electrically conductive spring placed between said conductive material of said internal surface and said die electrical contact,

whereby said spring resiliently forces said sensor die against at least one of said walls of said cavity and completes a conductive path which includes said conductive channel from said external conductive contact to said die electrical contact,

said case having a conductive top surface and a second conductive channel placed in one of said walls between a second external conductive contact on the exterior of said case and said conductive top surface,

said sensor die having top and bottom sides with said bottom side facing downwardly in said cavity and said top side facing upwardly, said top side having a second electrical surface,

a conductive lid to which a downwardly facing electrically conductive top spring is attached, said lid being electrically connected while being physically secured to said top surface of said case,

said conductive top spring arranged and designed to force said sensor die downwardly in said cavity while contacting said second electrical surface,

whereby said lid and said attached secured spring simultaneously close said cavity, force said sensor die into said cavity, and complete an electrically conductive path from said second external conductive contact to said second electrical surface of said die.

6,040,626

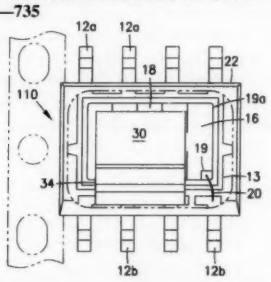
SEMICONDUCTOR PACKAGE

Chuan Cheah, El Segundo; Jorge Munoz, Cypress, and Dan Kinzer, El Segundo, all of Calif., assignors to International Rectifier Corp., El Segundo, Calif.

Provisional application No. 60/101,810, Sep. 25, 1998. This application Jan. 4, 1999, Appl. No. 225,153.

Int. Cl.[7] **H01L** *23/48;23/52;29/40*

U.S. Cl. 257—735 **28 Claims**



1. A power semiconductor package, comprising:

a bottom leadframe having a bottom plate portion and at least one first terminal extending from the bottom plate portion;

at least one second terminal being co-planar with the first terminal;

a third terminal;

a semiconductor power MOSFET die having a bottom surface defining a drain connection and a top surface on which a first metalized region defining a source and a second metalized region defining a gate are disposed, the bottom surface being coupled to the bottom plate of the leadframe such that the first terminal is electrically connected to the drain;

a copper plate coupled to and spanning a substantial part of the first metalized region defining the source connection;

at least one beam portion being sized and shaped to couple the copper plate portion to the at least one second terminal such that it is electrically coupled to the source; and

a wire bond coupling the gate to a third terminal.

6,040,627

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Akihiko Harada, and Keiichi Higashitani, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1998, Appl. No. 59,702

Int. Cl.[7] **H01L** *23/48;23/52;29/40*

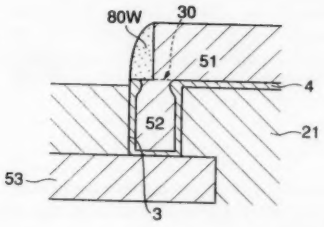
U.S. Cl. 257—752 **8 Claims**

1. A semiconductor device comprising:

a first insulating film formed on a semiconductor substrate;

a first conductive element formed on the first insulating film with a high melting point barrier metal therebetween;

a second conductive element formed in a plugging space of the insulating film and electrically connected to the first conductive element at an opening on the first insulating film, a portion of which opening is covered by the first conductive element; and



a sidewall formed on a side surface of the first conductive element and having a bottom surface covering a portion of the opening of the plugging space which is not covered by the first conductive element.

6,040,628

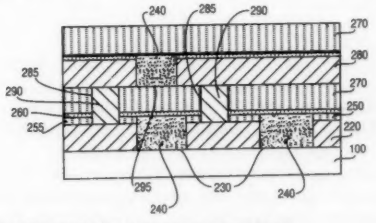
INTERCONNECT STRUCTURE USING A COMBINATION OF HARD DIELECTRIC AND POLYMER AS INTERLAYER DIELECTRICS

Chien Chiang, Fremont, and David B. Fraser, Danville, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1996, Appl. No. 769,549

Int. Cl.[7] **H01L** *23/48;23/58*

U.S. Cl. 257—760 **20 Claims**



1. An integrated circuit structure, comprising:

a first layer of electrically conductive material in which a trench separates one section of the first layer of electrically conductive material from another section of the first layer of electrically conductive material;

a planarization stop layer having a thickness of about 300 to 1,000 angstroms formed on the surface of the first layer of electrically conductive material;

a first insulating material substantially filling the trench of said first layer of electrically conductive material;

a protective coating having a thickness of less than about 300 angstroms formed over said first insulating material; and

a second insulating material deposited over said protective coating.

6,040,629

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING SILICIDED ELEMENTS OF SHORT LENGTH

Satoshi Shimizu, and Hidekazu Oda, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1997, Appl. No. 868,738

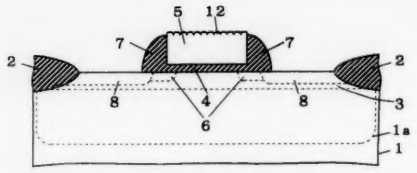
Claims priority, application Japan, Feb. 5, 1997, 9-022426

Int. Cl.[7] **H01L** *23/48;23/52;29/40*

U.S. Cl. 257—770 **3 Claims**

1. A semiconductor integrated circuit comprising:

an insulating film;



a conductive member being provided on said insulating film and insulated by said insulating film for supplying an electric charge; and

side walls being provided on said insulating film and holding said conductive member,

said conductive member including a silicide layer being provided on its surface with a number of undulations having semispherical projections,

said conductive member, being held between said side walls, having only a width being not more than $(2/\pi)$ times a width hardly causing phase transition of silicide when said silicide layer is flatly formed, said semispherical projections having a radius smaller than $(2/\pi)$ times said width hardly causing the phase transition.

6,040,630

INTEGRATED CIRCUIT PACKAGE FOR FLIP CHIP WITH ALIGNMENT PREFORM FEATURE AND METHOD OF FORMING SAME

Karen A. Panchou, Grant; Charles M. Newton, Palm Bay, and Charles D. Rosier, Indialantic, all of Fla., assignors to Harris Corporation, Palm Bay, Fla.

Filed Apr. 13, 1998, Appl. No. 59,163

Int. Cl.[7] H01L *23/48;23/52;29/40*

U.S. Cl. 257—783 **14 Claims**

1. An integrated circuit package comprising:

a substrate;

a circuitry pattern formed on the substrate;

a thermoplastic attachment film positioned on the substrate and having vias that expose the circuitry pattern;

a flip chip having input/output contacts formed as conductive thermoplastic bumps, wherein said flip chip is mounted on the thermoplastic attachment film such that the conductive thermoplastic bumps are received within the cut openings and engage the circuitry pattern, wherein the thermoplastic attachment film forms an underfill and the thermoplastic attachment film and conductive thermoplastic bumps form a thermoplastic bond between the substrate and the flip chip that allows ready removal of the flip chip upon application of heat when the thermoplastic attachment film and the thermoplastic conductive bumps become pliable and allow removal.

6,040,631

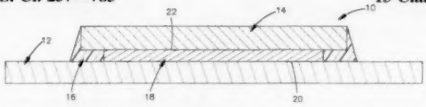
METHOD OF IMPROVED CAVITY BGA CIRCUIT PACKAGE

Eric P. Dibble, Endicott; Eric A. Johnson, Greene, and Raymond A. Phillips, Jr., Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 27, 1999, Appl. No. 238,872

Int. Cl.[7] H01L *23/48;23/52;29/40*

U.S. Cl. 257—783 **13 Claims**



1. An integrated circuit package comprising a semiconductor chip having a chip connection surface thereon, a metal heat spreader having a heat-spreader connection surface and an adhesive bond adhering said chip to said heat spreader, said bond comprising

a first adhesive attached to a first portion of said chip connection surface and to a first portion of said heat spreader connection surface, and

a second adhesive attached to a second portion of said chip connection surface and to a second portion of said heat spreader connection surface wherein said second adhesive exhibits higher thermal, conductivity than said first adhesive and lower bond strength than said first adhesive.

6,040,632

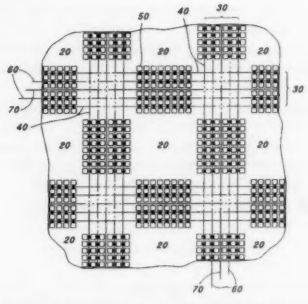
MULTIPLE SIZED DIE

Qwai H. Low; Chok J. Chia, both of Cupertino, and Seng-Sooi Lim, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jan. 14, 1998, Appl. No. 6,784

Int. Cl.[7] H01L *27/10*

U.S. Cl. 257—784 **6 Claims**



1. A wafer on which multiple-sized integrated circuit (IC) dies are formed comprising:

(a) a wafer;

(b) a plurality of IC dies formed on the wafer, each IC die having a periphery;

(c) multiple rows of bonding pads located near and along the periphery of each IC die, adjacent bonding pads on separate rows of each IC die being electrically connected to each other; and

(d) a plurality of scribe lines positioned between the multiple rows of bonding pads whereby each scribe line defines a different IC die size.

6,040,633

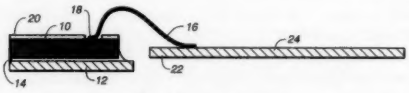
OXIDE WIRE BOND INSULATION IN SEMICONDUCTOR ASSEMBLIES

Kamran Manteghi, Manteca, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Division of application No. 08/997,295, Dec. 23, 1997. This application Feb. 11, 1999, Appl. No. 249,225.

Int. Cl.[7] **H01L** *21/44*

U.S. Cl. 257—784 **14 Claims**



1. An improved semiconductor integrated circuit package with electrically-insulated bonding wires, comprising:

a semiconductor die attached to a mounting base;

a plurality of aluminum bonding wires having respective first ends wire-bonded to respective bonding pads on the semiconductor die and having respective second ends bonded to respective bonding fingers at inner ends of leads of a leadframe;

the aluminum bonding wires having an oxygen-plasma oxide formed thereupon to thereby provide electrically-insulated bonding wires to prevent short-circuits between adjacent bonding wires; and

the leads of the leadframe also having an oxygen-plasma oxide formed thereupon except at the exposed outer ends thereof.

6,040,634

ELECTRIC MOTOR/THERMAL ENGINE DRIVE FOR A VEHICLE IN WHICH THE ELECTRIC MOTOR FUNCTIONS AS A FLYWHEEL, STARTER MOTOR, AND GENERATOR

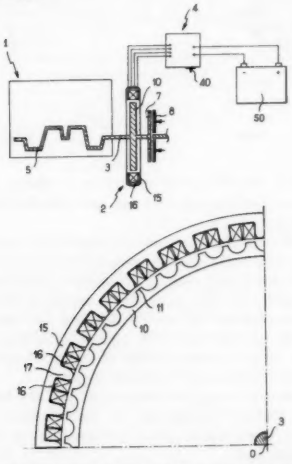
René Larguier, 39 Boulevard d'Argenson, F-92200 Neuilly-sur-Seine, France

Continuation-in-part of application No. 08/651,852, Jan. 30, 1996, which is a continuation of application No. 08/252,252, which is a continuation of application No. 07/861,787, filed as application No. PCT/FR90/00916, Dec. 17, 1990, abandoned. This application Aug. 5, 1996, Appl. No. 692,099.

Claims priority, application Luxembourg, Dec. 19, 1989, 87644

Int. Cl.[7] **B60L** *11/02*

U.S. Cl. 290—45 **5 Claims**



1. In a vehicle engine unit that includes a thermal engine having a maximum torque and a starting resisting torque at a lowest ambient temperature for operating the thermal engine, and an electric motor mounted coaxially with the thermal engine,

the electric motor having a nominal torque, a maximum torque at zero and low speed, and a maximum torque per unit volume, where the volume is defined by a cylinder having a diameter and an axial length of active parts of the electric motor, the active parts being a stator, a rotor, and stator coils,

the electric motor being arranged and constructed to provide inertia to the thermal engine during operation of the thermal engine, to start the thermal engine, and to provide electricity when the electric motor is being driven by the thermal engine, and

the stator and the rotor are both substantially flat, where a ratio of a total axial length of the electric motor to a diameter of the electric motor does not exceed one-third:

the improvement in which the electric motor has a total axial length of no more than 100 mm and a diameter of no more than 350 mm, the electric motor is arranged and constructed to provide the maximum torque at zero and low speed that is more than twice the nominal torque of the electric motor and more than the starting resistive torque of the thermal engine at the lowest ambient temperature for operating the thermal engine, and in which the maximum torque per unit volume of the electric motor is at least 10 Nm per cubic decimeter at zero and low speed.

6,040,635

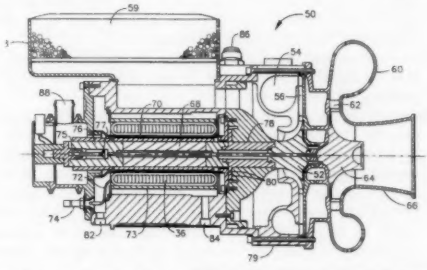
MICROTURBINE POWER GENERATING SYSTEM

Robert A. Nims, Rancho Palos Verdes; Patrick Lee O'Brien, Torrance, and Terrence Emerson, Hermosa Beach, all of Calif., assignors to AlliedSignal, Inc., Morristown, N.J.

Filed Dec. 20, 1997, Appl. No. 995,462

Int. Cl.[7] **F01D** *15/10*

U.S. Cl. 290—52 **12 Claims**



1. A rotating group for a microturbine power generating system, comprising:

a turbine wheel receiving expanding gas, the expanding gas causing the turbine wheel to rotate about an axis;

a rotor having a rotor bore concentric with the axis, at least a portion of said rotor being magnetic;

a single tieshaft having a diameter of less than about one-half inch, the tieshaft being concentric with the axis and extending through the rotor bore, the tieshaft having a yield strength and being preloaded in tension to a predetermined percentage of said yield strength; and

means for maintaining the tension in the tieshaft and securing said rotor and said turbine wheel to rotate in unison with the tieshaft.

6,040,636

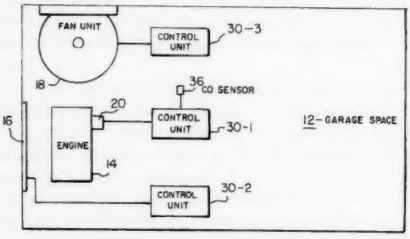
SYSTEM CONTROLLING VEHICLE WARM UP OPERATION RESPONSIVE TO ENVIRONMENT CO LEVEL

John R. DiCroce, Oceanside, N.Y., assignor to Audiovox Corporation, Hauppauge, N.Y.

Filed Nov. 13, 1997, Appl. No. 969,681

Int. Cl.[7] F02N *17/00*

U.S. Cl. 307—10.1 **7 Claims**



1. System for controlling vehicle engine operation responsive to engine emitted CO presence in a closed space wherein the engine is operated and for controlling ventilation of the space to reduce a level of the CO therein, said system comprising

a device connected with the engine having an engine shutdown mode operable on receipt thereby of a shutdown signal to shutdown the engine when the engine is operating,

a first control unit operable on an initiation thereof to output at least a first discrete RF signal,

a second control unit,

a CO sensor unit for sensing a presence of CO, the CO sensor unit outputting a distinct signal when a sensed CO value is above an acceptable level, said CO sensor being effective to initiate operation of said first control unit,

one of said distinct signal and said at least a first discrete RF signal constituting the engine shutdown signal, an other of said distinct and said at least a first discrete RF signals being received by the second control unit for enabling a start of a space ventilation operation which includes the opening of a closure member separating a communication of the closed space with an outside air environment, and the operation of a fan unit for exchanging CO containing air from within the closed space with air from the outside air environment, the second control unit being associated with the opening of said closure member, the system including

a third control unit associated with said fan unit, said at least a first RF signal being received by said third control unit for enabling start of said fan unit,

the respective ones of the second and third control units controlling the closure member and fan unit, respectively, with a circuit connection thereto which includes control relays in the control units, receipt of the said other of said distinct and said at least a first of said discrete RF signals by said second control unit and receipt of said at least a first discrete RF signal by said third control unit being effective to provide momentary relay contact closure to start opening the closure member and turn on the fan unit.

6,040,637

SELECTOR SWITCH CIRCUIT FOR DISABLING AN AIRBAG

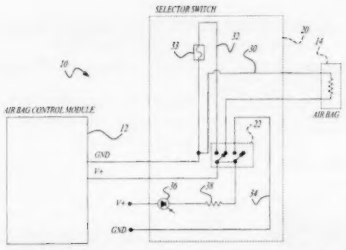
Lisa M. Paganini, Howell; Frank Casilio, Troy; Roy Peters, Almont; Kurt M. Straub, Plymouth; Rene C. DeHondt, Armada, and Tova Fry, Detroit, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Apr. 1, 1998, Appl. No. 53,037

Int. Cl.[7] B60R *21/16*

U.S. Cl. 307—10.1 **12 Claims**

1. A selector switch system for disabling an airbag of a motor vehicle, comprising:



an electrical power source having a supply terminal and a return terminal;

a switch connected to the supply terminal of said power source;

a first circuit path connected to said switch for activating the airbag, said first circuit path having an airbag device; and

a second circuit path connected to said switch for preventing activation of the airbag;

said switch selectively movable between an enabled position for enabling the airbag device by interconnecting the supply terminal of said power source to said first circuit path, and a disabled position for preventing activation of said airbag device by interconnecting the supply terminal of said power source to said second circuit path, whereby the supply terminal of said power source does not connect to said first circuit path in the disabled position.

6,040,638

IMMOBILIZATION SYSTEM FOR MOTOR VEHICLES

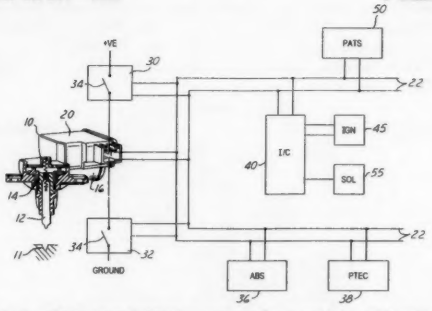
Steven Christopher Howell, Leamington Spa, United Kingdom, assignor to Jaguar Cars, Limited, Whitley, Coventry, United Kingdom

Filed Oct. 13, 1998, Appl. No. 170,379

Claims priority, application United Kingdom, Oct. 15, 1997, 9721777

Int. Cl.[7] B60R *25/00*

U.S. Cl. 307—10.2 **8 Claims**



1. A vehicle immobilization system for a vehicle, said vehicle having an on/off switch and an engine, said vehicle immobilization system comprising:

an electronically controlled locking mechanism responsive to a remote command signal to move between a locked state and an unlocked state, said electronically controlled locking mechanism requiring an electrical supply to move in either direction between said locked state and said unlocked state, such that said electronically controlled locking mechanism remains in its current locked or unlocked state whenever disconnected from said electrical supply;

switch means for selectably connecting said electronically controlled locking mechanism to said electrical supply in response to an enable power command and a disable power command; and

control means coupled to said electronically controlled locking mechanism and said switch means, said control means gener-

ating said enable power command in response to activity of said on/off switch and preventing said enable power command when said engine is running or when said vehicle is moving.

6,040,639

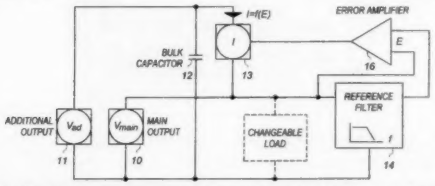
CIRCUIT FOR IMPROVED LOAD TRANSIENT RESPONSE IN POWER SUPPLIES

Thomas Ginell, Hagersten; Lars Thorsell, Upplands-Vasby, and Per Lindman, Djursholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 29, 1995, Appl. No. 536,098

Int. Cl.[7] H02J *1/10*

U.S. Cl. 307—44 **11 Claims**



1. An electric power supply for a changeable load, comprising:

means for supplying an electric direct current to the changeable load;

additional means, operatively connected to the supplying means, for supplying additional electric direct current to the load in response to changes in the load; and

means for sensing changes in an output voltage of the supplying means and for controlling the additional supplying means based on the sensed voltage changes;

wherein an output voltage of the additional supplying means is larger than the output voltage of the supplying means, and the supplying means, additional supplying means, and sensing means are connected in a closed loop.

6,040,640

DIRECT VOLTAGE BACK-UP SYSTEM AT A POWER SUPPLY OUTLET

Hans-Joachim Gehre, Chemnitz, and Frank Winterstein, Nuernberg, both of Germany, assignors to Siemens Aktiengesellschaft, München, Germany

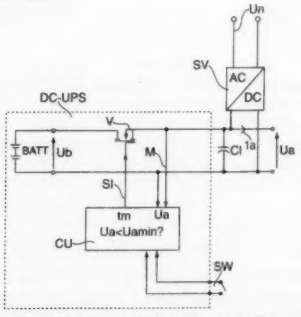
PCT No. PCT/DE96/02011, § 371 Date Jun. 18, 1998, § 102(e) Date Jun. 18, 1998, PCT Pub. No. WO97/15976, PCT Pub. Date May 1, 1997

PCT Filed Oct. 23, 1996, Appl. No. 66,474

Claims priority, application Germany, Oct. 26, 1995, 195 39 928

Int. Cl.[7] H02J *7/00*

U.S. Cl. 307—66 **8 Claims**



1. A device for backing-up a DC voltage at a DC voltage output of a power-line operated power supply, the power supply supplying power to a load, the device comprising

at least one back-up battery; and

a control unit performing the following functions:

comparing an actual value of the DC voltage at the DC voltage output to a predetermined minimum value,

connecting the at least one back-up battery to the DC voltage output of the power supply when an actual value of the DC voltage is less than the predetermined minimum value, the at least one connected back-up battery providing a battery voltage which, together with the DC voltage at the DC voltage output of the power supply, supplies the power to the load,

determining a predetermined back-up time period,

disconnecting the at least one connected back-up battery from the DC voltage output of the power supply after the predetermined back-up time period expires, and

repeating a comparison of the actual value of the DC voltage to the predetermined minimum value.

6,040,641

METHOD FOR MANUFACTURING PROBABILISTIC SWITCH USING MULTIPLICATIVE NOISE

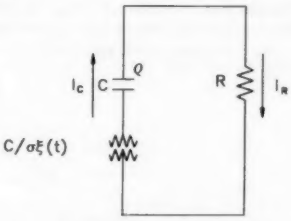
Seung-Hwan Kim; Seon-Hee Park, and Chang-Su Ryu, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Jun. 26, 1997, Appl. No. 882,875

Claims priority, application Rep. of Korea, Jun. 27, 1996, 96-24715

Int. Cl.[7] H01H *1/04;* **H02B** *1/24*

U.S. Cl. 307—112 **3 Claims**



1. A method for manufacturing a probabilistic switch in a probabilistic computer for probabilistically performing computations, the method comprising the steps of:

applying an electrical signal to a nonlinear device;

applying a multiplicative noise to the nonlinear device, the multiplicative noise having an intensity which varies with an operation state of the nonlinear device; and

controlling the applied multiplicative noise intensity and an initial condition of the electrical signal applied to the nonlinear device to control probability so as to probabilistically generate different logic signal states.

6,040,642

LINEAR MOTOR EQUIPPED WITH A STATOR WHICH IS EASILY ASSEMBLED

Noritaka Ishiyama, Inagi, Japan, assignor to GMC Co., Ltd., Kawasaki, Japan

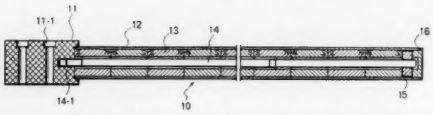
Filed May 12, 1998, Appl. No. 75,872

Claims priority, application Japan, May 12, 1997, 9-120830

Int. Cl.[7] H02K *41/00*

U.S. Cl. 310—12 **3 Claims**

1. A linear motor including a stator which comprises a plurality of permanent magnets assembled in series so that those opposite magnetic poles may face to each other, wherein each of the permanent magnets has a cylindrical base shape, the stator comprises a center shaft made of non-magnetic material and inserted in the plurality of permanent magnets, and the plurality of permanent



magnets are tightened from both sides thereof so that the adjacent permanent magnets may be close to each other, wherein the stator ftnther comprises a tubular member made of non-magnetic material and covering the outer peripheries of the plurality of permanent magnets, wherein the stator further comprises a bracket provided with a female screw portion, a male screw portion provided on one end portion of the center shaft is relatively screwed in the female screw portion of the bracket, another male screw portion having a predetermined length is provided on the other end side of the center shaft, and a nut is engaged with the male screw portion on the other end side so that the permanent magnets are brought into close contact with each other between the nut and the bracket.

6,040,643

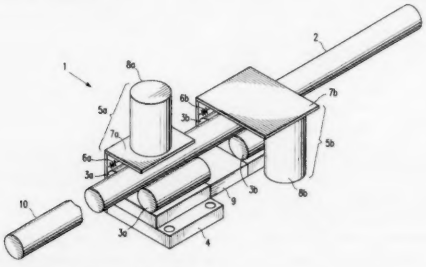
LINEAR ACTUATOR

Donald G. Bruns, San Diego, Calif., assignor to Thermotrex Corporation, San Diego, Calif.

Provisional application No. 60/066,231, Nov. 20, 1997. This application Nov. 20, 1998, Appl. No. 197,303.

Int. Cl.[7] **H02K** *41/00;* **H02N** *2/00*

U.S. Cl. 310—26 **20 Claims**



1. A linear actuator including:

(a) guide structures;

(b) an armature slidably mounted on the guide structures;

(c) a normally closed electromagnetic clamp assembly operationally positioned with respect to the armature to prevent sliding movement of the armature when closed and allow sliding movement of the armature when open;

(d) a normally open electromagnetic clamp assembly operationally positioned with respect to the armature to allow sliding movement of the armature when open and prevent sliding movement of the armature when closed, and spaced apart from the normally closed electromagnetic clamp assembly; and

(e) a high resolution translator coupled between the normally closed and the normally open electromagnetic clamp assemblies, for changing the spacing between the normally closed and the normally open electromagnetic clamp assemblies;

wherein the armature is selectively extended or retracted with respect to the linear actuator by controlled sequencing of the translator and opening and closing of the normally closed and the normally open electromagnetic clamp assemblies.

6,040,644

SHAFT FOR A MOTOR-DRIVEN SPINDLE

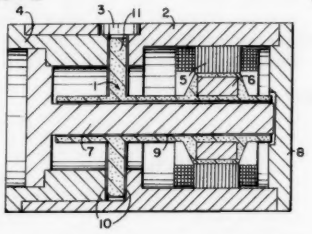
Johann Schuster, Nuremberg, Germany, assignor to Paul Müller GmbH & Co. KG, Nuremberg, Germany

Filed Jun. 19, 1998, Appl. No. 100,836

Claims priority, application Germany, Jun. 20, 1997, 197 26 341

Int. Cl.[7] **H02K** *21/14*

U.S. Cl. 310—43 **10 Claims**



1. A shaft for a motor-driven spindle, comprising:

an elongate section made of a reinforced plastic material,

a rotor arranged around said elongate section and surrounded by reinforced plastic material, and

a faceted wheel surrounding said elongate section and including a plurality of reflective surfaces on an outer circumference thereof, said faceted wheel being incorporated into the reinforced plastic material.

6,040,645

ELECTRICAL MACHINES

Cedric M. Lynch, Potters Bar, United Kingdom, assignor to London Innovation Ltd., London, United Kingdom

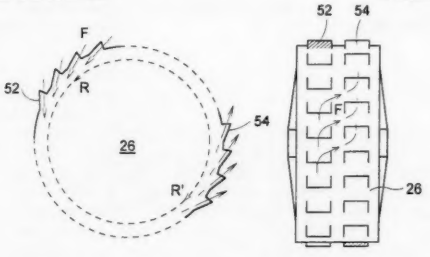
PCT No. PCT/GB94/02821, § 371 Date Apr. 13, 1998, § 102(e) Date Apr. 13, 1998, PCT Pub. No. WO95/17779, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 23, 1994, Appl. No. 669,403

Claims priority, application United Kingdom, Dec. 23, 1993, 9326353

Int. Cl.[7] **H02K** *9/00;9/02;9/04;9/28*

U.S. Cl. 310—58 **4 Claims**



1. A casing for an electrical machine having a rotor, said casing having first and second sets of cooling vents enabling cooling fluid to flow respectively into and out of said casing when said rotor rotates, the first and second sets of vents being disposed in a radially outer portion of the casing and being arranged to direct cooling fluid tangentially into and out of, respectively, said casing.

6,040,646

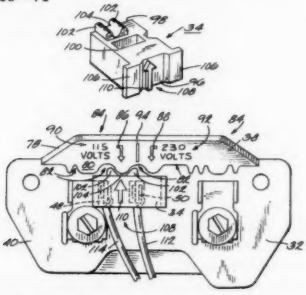
PLUG FOR CHANGING AN OPERATING CONDITION OF AN ELECTRIC MOTOR

Richard E. Peters, Tipp City, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 22, 1999, Appl. No. 235,433

Int. Cl.[7] H02K *11/00;* **H01R** *27/00*

U.S. Cl. 310—71 **23 Claims**



1. An electric motor having an axis, said electric motor comprising:

a housing;

a stator fixed relative to said housing;

a shaft rotatable about the axis;

a rotor supported by said shaft for rotation therewith relative to said stator;

a support structure which is fixed relative to said housing and which has at least one electrical contact;

a plug which has at least one electrical contact engageable with said support structure electrical contact such that said plug is electrically connectable to said support structure in at least first and second positions in which at least one plug electrical contact engages at least one support structure electrical contact, said support structure and said plug engaging each other independently of said electrical contacts such that said plug is positionable only in a number of predetermined acceptable positions, including said first and second positions, and such that said plug is not positionable in an unacceptable position in which one plug electrical contact would engage one support structure electrical contact and in which said plug would be positionable except for said engagement of said plug and said support structure independently of said electrical contacts; and

wherein one of said support structure and said plug includes two projections, and wherein the other of said support structure and said plug includes a recess, such that when said plug is electrically connected to said support structure in said first position, one of said projections mates with said recess, and such that when said plug is electrically connected to said support structure in said second position, said other of said projections mates with said recess.

6,040,647

ELECTROMAGNETIC DEVICE HAVING ENCAPSULATED CONSTRUCTION AND PRECISE POSITIONING OF BEARING AND SHAFT AXES

Cary Lee Brown, Evansville, Ind.; Richard C. Hartsfield, Chesterfield, Mo.; Bernard Gerald Harter, Lynnville, Ind., and Brian Schoolcraft, Statesville, N.C., assignors to Emerson Electric Co., St. Louis, Mich.

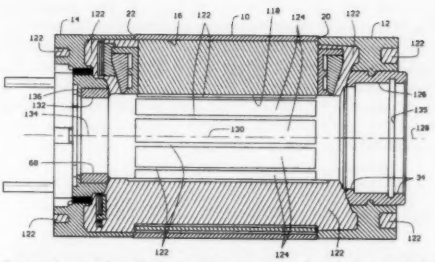
Provisional application No. 60/068,768, Dec. 23, 1997. This application Dec. 18, 1998, Appl. No. 216,328.

Int. Cl.[7] H02K *5/00*

U.S. Cl. 310—89 **21 Claims**

1. A housing for an electric motor comprising:

a metallic shell having an axial length with opposite first and second end surfaces and first and second openings in the first and second end surfaces;



first and second endbells covering over the first and second shell end surfaces, respectively, the first and second endbells each having a shaft opening aligned with the fist and second end surface openings, respectively, and the first and second endbells each having at least one secondary opening through each endbell;

a body of resin encapsulant contained inside the shell and extending into the secondary openings of the first and second endbells and thereby holding the first and second endbells to the first and second shell and surfaces, respectively; and

a stator is contained in the shell, the shell engages in a tight fit around the stator and the encapsulant permeates the stator.

6,040,648

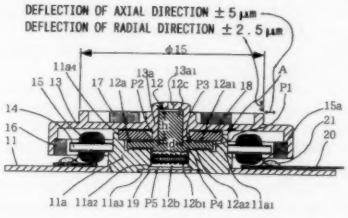
SPINDLE MOTOR AND ROTATOR DEVICE

Naoki Kawawada; Hiroaki Namiki; Isamu Takehara; Tadao Iwaki; Takashi Ishida; Shinichi Hayashizaki; Hirotada Shimaguchi, and Katsushige Konno, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan

Filed Jan. 22, 1999, Appl. No. 235,671

Int. Cl.[7] H02K *5/16;* **F16C** *32/06*

U.S. Cl. 310—90 **17 Claims**



1. A spindle motor comprising: a housing; a rotating shaft mounted to the housing to undergo rotational movement, the rotating shaft having a rotor supporting portion, a thrust bearing portion, and a radial bearing portion; a rotor fixed to the rotor supporting portion of the rotating shaft to undergo rotational movement therewith; a magnet mounted to the rotor; a stator having a stator coil fixed to the housing to oppose the magnet and to generate a magnetic force in cooperation with the magnet to cause the rotor and the rotating shaft to undergo rotation; a liquid dynamic pressure bearing comprising opposing surfaces of the housing and the rotating shaft; the thrust bearing portion of the rotating shaft comprising a disk-shaped member formed at an intermediate portion of the rotating shaft between the rotor supporting portion and the radial bearing portion, and having a larger diameter than said other portions of the rotating shaft, the radial bearing portion and the rotor supporting portion being formed at opposite axial ends of the rotating shaft; a cylindrical hole formed in the housing in which the thrust bearing portion and the radial bearing portion of the rotating shaft are supported to undergo rotational movement, the cylindrical hole having a first portion with a first diameter in which the radial bearing portion is disposed and a second portion with a second diameter larger than the first diameter in which the thrust bearing portion is disposed; lubricant oil filled in a portion of the cylindrical hole surrounding the thrust bearing portion and the radial bearing portion; and a presser ring

fixed to the housing to cover the cylindrical hole around the rotating shaft to seal the lubricant oil in the housing; wherein the rotor has a boss portion formed at a center thereof, the boss portion having an inner peripheral surface which contacts and is fixed to the rotor supporting portion of the rotating shaft, and wherein a magnetic center of the magnet in the axial direction of the rotating shaft and a magnetic center in the same direction of the stator coil are substantially matched.

6,040,649

SUPPORT STRUCTURE APPARATUS FOR A SPINDLE MOTOR OF A COMPACT DISC MACHINE

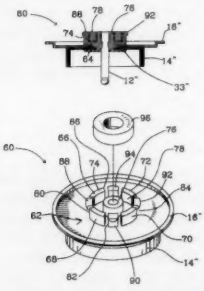
Alex Horng, Kaohsiung, Taiwan, assignor to Sunonwealth Electric Machine Industry Co., Ltd., Taiwan

Filed Apr. 19, 1999, Appl. No. 295,476

Claims priority, application Taiwan, Jan. 11, 1999, 88200347

Int. Cl.[7] H02K *5/00;5/16;7/00;* **G11B** *17/08;5/016*

U.S. Cl. 310—91 **19 Claims**



15. A support structure apparatus for a spindle motor, comprising:

(a) a rotor base having an upper surface, said upper surface including a centrally disposed hole;

(b) a shaft passing through said hole of said rotor base, said shaft including a pair of slots disposed thereon;

(c) a support plate disposed on said upper surface of said rotor base, said support plate including an integrally formed binding member, said binding member including a recess for securing said rotor base adjacent said support plate and to said binding member while maintaining said shaft in a fixed position by enveloping said slots on said shaft, thereby providing enhanced securement of said shaft onto said binding member; and

(d) a hub for receiving a compact disc, said hub incorporated on said binding member.

6,040,650

STATOR WITH COPLANAR TAPERED CONDUCTORS

Dantam K. Rao, 2212 Lynnwood Dr., Schenectady, N.Y. 12309

Continuation-in-part of application No. 09/106,773, Jun. 30, 1998. This application Sep. 30, 1998, Appl. No. 163,171.

Int. Cl.[7] H02K *1/22*

U.S. Cl. 310—268 **17 Claims**

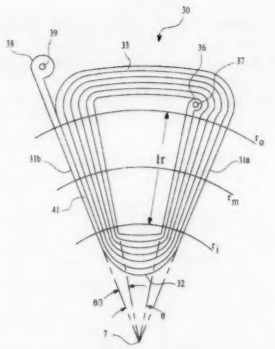
1. A stator for use with a rotor that contains permanent magnets:

said stator having a center and an axial thickness and a radial extent;

a plurality of overlapping coils spaced and extending arcuately around said center of said stator;

said coils being formed of electrical conductors with each having an inner section and an outer section and two radial sections that extend between said inner section and said outer section with an open area formed within said inner, outer and radial sections;

said coils each having an axial thickness;



each said radial section having an active sector along a length of said radial section that has said permanent magnets of said rotor passed adjacent to it;

said overlapping coils including a first coil and a second leading coil and a third trailing coil;

one said active sector of said radial section of said second leading coil and one said active sector of said radial section of said third trailing coil fit within said open area of said first coil with said active sectors of said first coil and said second leading coil and said third trailing coil each having essentially the same said axial thickness and wherein said overlapped first coil and second leading coil and third trailing coil active sectors combined together have an axial thickness essentially equal to said axial thickness of each of said radial sectors of each of said coils;

said electrical conductors forming said active sectors of said radial sections are tapered so as to be wider as said conductors extend outwardly from said stator center.

6,040,651

SURFACE ACOUSTIC WAVE DEVICE

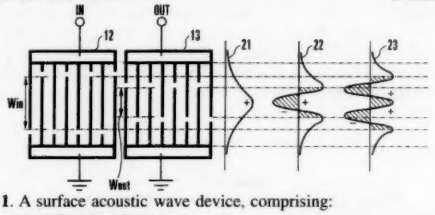
Susumu Yoshimoto, and Yasushi Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of application No. 08/948,060, Oct. 9, 1997. This application Jul. 23, 1999, Appl. No. 359,114.

Claims priority, application Japan, Oct. 14, 1996, 8-270943

Int. Cl.[7] H03H *9/25*

U.S. Cl. 310—313 B **1 Claim**



1. A surface acoustic wave device, comprising:

a piezoelectric substrate;

an input first interdigital electrode formed on said piezoelectric substrate; and

an output second interdigital electrode formed on said piezoelectric substrate adjacent said first interdigital electrode,

wherein a ratio of an overlap width to an aperture width of said first interdigital electrode and a ratio of an overlap width to an aperture width of said second interdigital electrode are set to different values, said ratio of an overlap width to an aperture width of said second interdigital electrode selected so that a first predetermined transverse mode is suppressed and said ratio of an overlap width to an aperture width of said first interdigital electrode selected so that a second predetermined transverse mode is suppressed.

6,040,652

PIEZOELECTRIC RESONATOR ADAPTED TO GENERATE A HARMONIC WAVE IN A THICKNESS EXTENSIONAL VIBRATION MODE

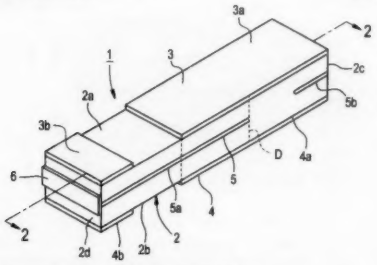
Hiroaki Kaida, Moriyama, Japan, assignor to Murata Manufacturing Co., Ltd, Japan

Filed Dec. 16, 1998, Appl. No. 212,943

Claims priority, application Japan, Dec. 24, 1997, 9-355606

Int. Cl.[7] H03H *9/15*

U.S. Cl. 310—320 **19 Claims**



1. A piezoelectric resonator, comprising:

a piezoelectric member including piezoelectric layers;

a plurality of excitation electrodes disposed at respective vertical positions on or within said piezoelectric member and superposed on one another in a thickness direction of said piezoelectric member with said piezoelectric layers of said piezoelectric member interposed therebetween;

lead-out electrodes respectively connected to said excitation electrodes and extending to side surfaces of the piezoelectric member at the same vertical positions as the excitation electrodes; and

at least one dummy electrode disposed at least one of the vertical positions at which said excitation electrodes are disposed and arranged to have a symmetrical relationship with the lead-out electrode connected to the excitation electrode relative to the corresponding excitation electrode wherein said plurality of excitation electrodes are disposed within said piezoelectric member, a piezoelectric layer existing outside in the thickness direction of an outermost excitation electrode of said plurality of excitation electrodes.

6,040,653

PIEZOELECTRIC POSITIONER

Cormac G. O'Neill, Walnut Creek, Calif., assignor to Kinetic Ceramics, Inc., Hayward, Calif.

Continuation-in-part of application No. 08/733,156, Oct. 17, 1996, Pat. No. 5,925,969. This application Jun. 15, 1998, Appl. No. 94,901.

Int. Cl.[7] H02N *2/04;2/06*

U.S. Cl. 310—328 **21 Claims**

1. A piezoelectric positioner, comprising:

A) a frame;

B) a first piezoelectric stack mounted on said frame;

C) a second piezoelectric stack mounted on said frame;

D) a T-lever defining a yoke having a first side and a second side and a T-lever arm;

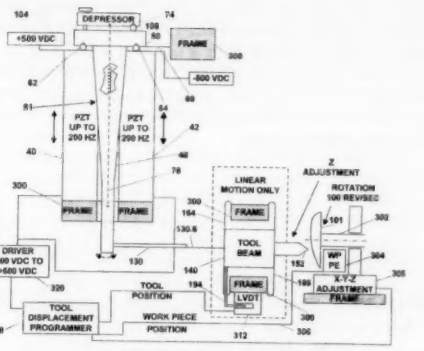
E) a compression element positioned to hold in compression:

1) said first stack between said first side of said yoke and said frame, and

2) said second stack between said second side of said yoke and said frame;

F) a programmable voltage source programmed to provide elongating voltages alternatingly to said first and said second stacks to cause said stacks to alternatingly expand against compressive forces produced by said compression element so as to cause said yoke to rock back and forth and to cause said T-lever arm to swing back and forth;

G) a tool beam flexibly connected to said T-lever arm;



H) a tool beam restraint for restraining movement of said tool beam to back and forth motion in a single direction.

6,040,654

PIEZOELECTRIC TRANSFORMER

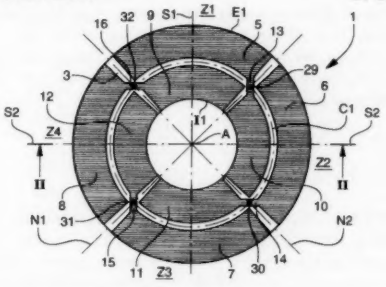
Ronan Le Letty, Grenoble, France, assignor to Eta SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed Aug. 10, 1998, Appl. No. 131,888

Claims priority, application Switzerland, Aug. 15, 1997, 1924/97

Int. Cl.[7] H01L *41/08*

U.S. Cl. 310—366 **14 Claims**



1. A piezoelectric transformer including:

a body made of piezoelectric material having a first and a second face and an outer lateral surface;

a plurality of primary electrodes arranged on said body to cause said body to vibrate in response to a primary alternative voltage; and

a plurality of secondary electrodes arranged on said body to generate a secondary voltage in response to said vibration;

said outer surface having, in the absence of said vibration, the shape of a first circular cylinder having a circular axis of symmetry and said faces each having an outer portion situated on the side of said outer lateral surface and an inner portion surrounded by said outer portion,

wherein said primary electrodes are arranged so that, when said primary voltage has a frequency at least substantially equal to a determined frequency, said outer lateral surface alternately takes the shape of a first elliptical cylinder and the shape of a second elliptical cylinder, said first elliptical cylinder having a major axis and a minor axis perpendicular to said circular axis of symmetry and respectively situated in a first plane of symmetry including said circular axis of symmetry and a second plane of symmetry perpendicular to said first plane of symmetry and also including said circular axis of symmetry, said second elliptical cylinder having a major axis and a minor axis perpendicular to said circular axis of symmetry and respectively situated in said second plane of symmetry and said first plane of symmetry, and, when said outer

lateral surface has the shape of one of said first and second elliptical cylinders, the respective major axis having a length which varies regularly increasing from a minimum value equal to the diameter of said circular cylinder to a maximum value then decreasing from said maximum value to said minimum value, said outer lateral surface then taking the shape of the other of said first and second elliptical cylinders.

6,040,655

CATHODE-RAY TUBE HAVING UNITARY ELECTRODE PLATE OF DIFFERENT THICKNESSES

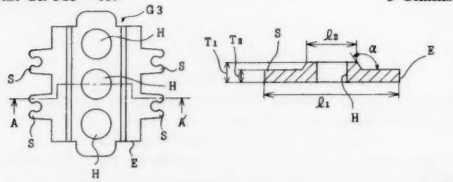
Takeshi Mera; Satoru Endo, and Mitsuhiro Sugiyama, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1993, Appl. No. 64,639

Claims priority, application Japan, May 26, 1992, 4-133182

Int. Cl.[7] H01J *29/46*

U.S. Cl. 313—409 **3 Claims**



1. A cathode-ray tube which has an electron gun that includes a one piece electrode plate, wherein said one piece electrode plate has a plurality of beam passage holes and bead supports, a portion having said beam passage holes and a portion having said bead supports are formed as a one piece structure, said two portions have different thicknesses and steps having inclined and continuous walls between said two portions.

6,040,656

GETTER FLASHING METHOD FOR CATHODE RAY TUBE AND GETTER FOR CONDUCTING SAME

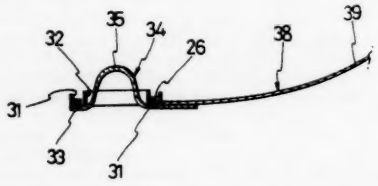
Jin-nyun Kim, Kyungki-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea

Filed May 4, 1998, Appl. No. 73,145

Claims priority, application Rep. of Korea, Jul. 25, 1997, 97 34928

Int. Cl.[7] H01J *31/00*

U.S. Cl. 313—481 **3 Claims**



1. A getter for a cathode ray tube with a funnel, the getter comprising:

a receptacle for receiving an active material;

a spacer for spacing the receptacle apart from an interior of the funnel by a predetermined distance; and

a support for supporting the receptacle and the spacer, wherein the receptacle comprises a hole for passing the spacer and a groove for receiving the active material therein.

6,040,657

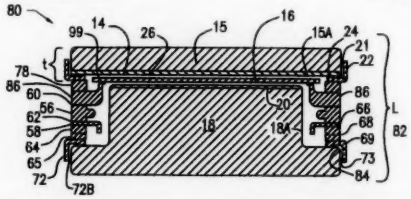
THIN FACEPLATE IMAGE INTENSIFIER TUBE HAVING AN IMPROVED VACUUM HOUSING

Warren David Vrescak, Roanoke; Daniel Brown Vest, Check; Nils Ian Thomas, Roanoke; Thomas N. Peck, Roanoke, and Thomas Mabry, Roanoke, all of Va., assignors to ITT Manufacturing Enterprises, Wilmington, Del.

Filed Aug. 15, 1997, Appl. No. 911,755

Int. Cl.[7] H01J *31/50*

U.S. Cl. 313—544 **21 Claims**



1. In an image intensifier tube having electrically operative components that include a microchannel plate (MCP) having an conductive input surface and a conductive output surface, retained within an evacuated environment of a vacuum housing, an improved photocathode having a photoemissive layer and a flat faceplate conductively engaging said photocathode along the entire surface of said faceplate, said flat faceplate and said photocathode in contact engagement only with a conductive support ring disposed in said vacuum housing for providing electrical contact to said photocathode external to said housing, wherein said conductive support ring is substantially aligned with a remainder of said vacuum housing.

6,040,658

DISCHARGE LAMP WITH HO RADICALS AS RADIATING ADDITIVES

Nikolai L. Bashlov; Alexandr Y. Vul; Sergei V. Kidalov; Sergei Kozyrev; Vyacheslav M. Milenin, and Nikolai A. Timofeev, all of St. Petersburg, Russian Federation, assignors to Aktsionernoe Obschestvo Zakkytogo Tipa Nauchno-Tekhniches Koe Agentstvo "Intellekt"

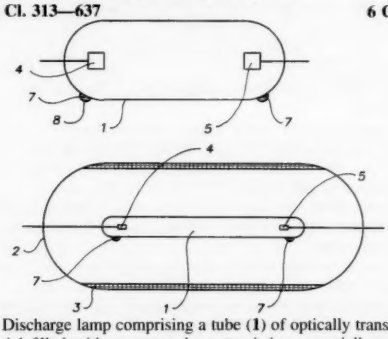
PCT No. PCT/RU96/00203, § 371 Date Apr. 20, 1998, § 102(e) Date Apr. 20, 1998, PCT Pub. No. WO97/05646, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 26, 1996, Appl. No. 11,150

Claims priority, application Russian Federation, Aug. 1, 1995, 95113226

Int. Cl.[7] H01J *17/20;61/12*

U.S. Cl. 313—637 **6 Claims**



1. Discharge lamp comprising a tube (**1**) of optically transparent material filled with an atmosphere consisting essentially of inert gas and radiating additive consisting of HO radicals, wherein an HO radical source is introduced to form the radiating additive, and further comprising means for maintaining a discharge in the atmosphere.

6,040,659

DISCHARGE LAMP LIGHTING DEVICE

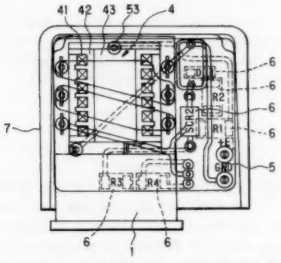
Kenichi Masuda; Tsutomu Hasegawa, and Fuminori Teramoto, all of Tsurugashima, Japan, assignors to Toyo Denso Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1998, Appl. No. 148,259

Claims priority, application Japan, Sep. 9, 1997, 9-284210

Int. Cl.[7] H01J *7/44*

U.S. Cl. 315—56 **7 Claims**



1. A discharge lamp lighting device having a housing with a power supply socket integrally formed therein and accommodating therein a discharge-lamp lighting-circuit assembly comprising a printed circuit board with wiring patterns and circuit components comprising a lamp lighting circuit thereon, a coil case mounted on the printed circuit board and connected to said lamp lighting circuit, said coil case having a primary coil formed by plural plate-conductors formed in parallel to each other at an outer surface of said coil case and a discharge lamp socket integrally formed on said coil case, a secondary-coil wound bobbin with a core inserted in a hollow center of said bobbin, wherein said discharge-lamp lighting-circuit assembly is mounted in said housing with a top portion of said discharge lamp socket projecting from an open-end of said housing and is connected at an output terminal of said coil case to said power supply socket formed in said housing and potted in said housing with insulating resin poured in a melted state and solidified therein to form a single solid device.

6,040,660

DEVICE FOR CONTROLLING THE INTENSITY OF THE LIGHT EMITTED BY A LIGHTING ELEMENT OF A LIGHTING APPARATUS, IN PARTICULAR A FLASHLIGHT

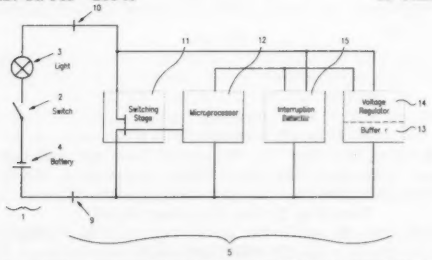
Rudolf Schmidt, Dr. Balthasar-Hubmeier-Str. 14 86316, Friedberg-West, and Augustin Thalhofer, Keltenstr. 16 86863, Langenneufnach-Unterrothern, both of Germany

Filed Jun. 13, 1997, Appl. No. 876,021

Claims priority, application Germany, Jul. 9, 1996, 196 27 607

Int. Cl.[7] H05B *37/02*

U.S. Cl. 315—200 A **18 Claims**



1. A device for controlling the intensity of the light emitted by a lighting element of a lighting apparatus, in particular a flashlight, the lighting apparatus including a light switch element, comprising:

a module arranged in series with the lighting element for controlling the supply of current to the lighting element,

said module having a detection device for detecting a control pulse triggered at the light switch element of the lighting apparatus;

a circuit device for controlling the light intensity of the lighting element; and

a central control device for detecting a detection signal of the detection device as well as for triggering said circuit device, wherein the control pulse, detected by said detection device, is an interruption of the supply current of the lighting element generated by means of the light switch element, at a time distance from the last control pulse of less than a preselected switch-over time interval, and wherein the light intensity of the lighting element is controlled in stages, and is reduced one stage by said circuit device when actuating the light switch element, within a time interval following prior actuation which is less than the switch-over time interval.

6,040,661

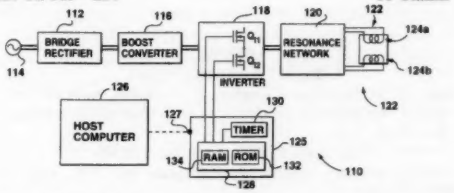
PROGRAMMABLE UNIVERSAL LIGHTING SYSTEM

Alexei Bogdan, Bolton, Canada, assignor to Lumion Corporation, Ontario, Canada

Provisional application No. 60/076,688, Feb. 27, 1998. This application May 12, 1998, Appl. No. 75,841.

Int. Cl.[7] H05B *37/02*

U.S. Cl. 315—224 **16 Claims**



1. A universal lamp system comprising:

(a) a lamp having a predetermined set of lamp operating characteristics, said operating characteristics including a lamp running voltage and a filament voltage, said lamp running voltage having a value between a first value and a second value and said lamp filament voltage having a value between a third value and a fourth value;

(b) a universal ballast having:

(i) a first power circuit for outputting a high frequency AC signal;

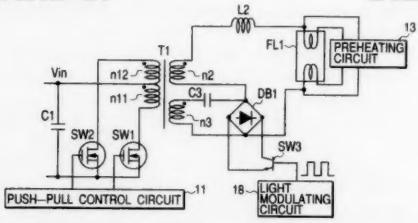
(ii) a coupling circuit coupled to the power circuit for applying the AC signal to the lamp to provide said lamp running voltage and said filament voltage at said lamp; and

(iii) a control circuit adapted to vary the duty cycle of the AC signal in a range of between about a 50/50 ratio and about a 2/98 ratio and the frequency of the AC signal in a range of between about 20 and about at least 47 kilohertz but not greater than about 55 kilohertz and therefore to vary said lamp running voltage between said first and second values and said filament voltage between said third and fourth values, said first and second values having a difference between them of about 77 percent and said third and fourth values having a difference between them of about 58 percent.

6,040,662
FLUORESCENT LAMP INVERTER APPARATUS

Atsushi Asayama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1997, Appl. No. 882
Claims priority, application Japan, Jan. 8, 1997, 9-011871
Int. Cl.[7] G05F *1/00*
U.S. Cl. 315—291 **11 Claims**



1. A fluorescent lamp inverter apparatus for lighting a fluorescent lamp, comprising:

a transducer;

a control circuit for driving a primary winding of said transducer;

a choking coil connected to a first secondary winding of said transducer, and connected in series with said fluorescent lamp;

a capacitor connected to a second secondary winding of said transducer; and

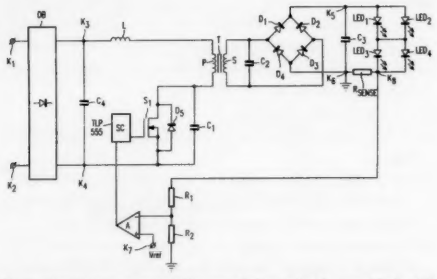
a switching circuit for switching over connection between said first secondary winding and said second secondary winding, to series connection or parallel connection;

wherein said switching circuit switches over the connection to the series connection or the parallel connection at a frequency lower than a frequency used when said control circuit drives said primary winding.

6,040,663
CIRCUIT ARRANGEMENT

Marcel J. M. Bucks, and Engbert B. G. Nijhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1998, Appl. No. 128,149
Claims priority, application European Pat. Off., Aug. 1, 1997, 97202401
Int. Cl.[7] G05F *1/00*
U.S. Cl. 315—291 **11 Claims**



1. A circuit arrangement for supplying a load, provided with a DC—DC converter comprising:

input terminals for connection to a DC voltage source;

a circuit portion comprising inductive means and first capacitive means, said circuit portion interconnecting the input terminals;

a switching element for shunting the first capacitive means;

a control circuit coupled to the switching element for rendering the switching element conducting and non-conducting with high frequency;

a transformer comprising a primary winding and a secondary winding, said primary winding being included in the circuit portion; and

an output circuit coupled to the secondary winding, said output circuit comprising:

output terminals for connection to the load;

rectifying means coupled between the secondary winding and the output terminals; and

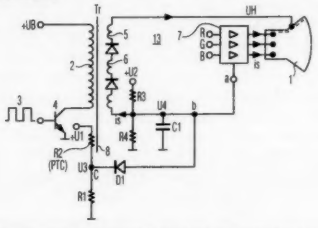
second capacitive means connected between the secondary winding and the output terminals,

characterized in that the rectifying means is full-wave rectifying means for ensuring that energy is transferred to the output terminals during two time intervals in each high frequency cycle of an output signal on the secondary winding.

6,040,664
CIRCUIT FOR LIMITING THE BEAM CURRENT OF A CATHODE RAY TUBE

Franz Dieterle, Schiltach, and Martin Läufer, Villingen-Schwenningen, both of Germany, assignors to Deutsche-Thompson Brandt GmbH, Germany

Continuation of application No. 08/829,545, Mar. 28, 1997, abandoned. This application Feb. 25, 1998, Appl. No. 999,879.
Claims priority, application Germany, Apr. 24, 1996, 196 16 272
Int. Cl.[7] H01J *29/52*
U.S. Cl. 315—383 **8 Claims**



1. An arrangement for providing high-tension for a cathode ray tube of a television receiver comprising:

a high tension transformer including a primary winding fed by an alternating current and a high-tension winding for providing the high-tension via rectifier means, both windings being arranged on a coil former located on a core of said transformer,

said cathode ray tube being coupled to a network for providing a control voltage for limiting the beam current of said cathode ray tube,

a temperature sensor being arranged in physical contact with the high tension transformer so that heat conduction between the body of said high tension transformer and the temperature sensor is provided, the temperature sensor being coupled to the network so that if the temperature of said high-tension transformer exceeds a predetermined value endangering said transformer, the beam current is reduced by said control voltage.

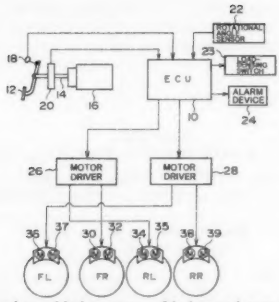
6,040,665
ELECTRIC BRAKE DEVICE

Kenji Shirai, Mishima; Seiya Yokoyama, Toyohashi, and Tsutomu Oota, Hamakita, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Aug. 2, 1999, Appl. No. 364,887
Claims priority, application Japan, Aug. 31, 1998, 10-246255
Int. Cl.[7] B60T *8/00;13/74*
U.S. Cl. 318—14 **8 Claims**

1. An electric brake device comprising:

a disc rotor which is rotatable together with a wheel of an automotive vehicle;



an output rod provided to press a friction pad onto the disc rotor so as to exert a braking force on the wheel;

a brake motor provided to generate a rotating force in response to an electric signal;

a gear mechanism provided to axially move the output rod relative to the disc rotor in accordance with the rotating force, such that the output rod is moved toward the disc rotor when the brake motor rotates in a forward direction, and that the output rod is separated from the disc rotor when the brake motor rotates in a reverse direction;

load detecting means for detecting a load acting on an end of the output rod opposite to a position where the output rod presses the friction pad onto the disc rotor; and

motor deceleration means for decreasing the rate of rotation of the brake motor when the load detected by the load detecting means is above a reference level.

6. An electric brake device comprising:

a disc rotor which is rotatable together with a wheel of an automotive vehicle;

an output rod provided to press a friction pad onto the disc rotor so as to exert a braking force on the wheel;

a brake motor provided to generate a rotating force in response to an electric signal;

a gear mechanism provided to axially move the output rod relative to the disc rotor in accordance with the rotating force, such that the output rod is moved toward the disc rotor when the brake motor rotates in a forward direction, and the output rod is separated from the disc rotor when the brake motor rotates in a reverse direction;

a sensor provided to output a signal indicative of a rotational angle of a rotation shaft, the rotation shaft being rotated by the brake motor and connected to the output rod; and

motor control means for decreasing the rate of rotation of the brake motor when the brake motor rotates in the reverse direction and the rotational angle indicated by the output signal of the sensor is above a reference angle, and the motor control means continuing the rotation of the brake motor when the brake motor rotates in the reverse direction and the rotational angle indicated by the output signal of the sensor is below the reference angle.

6,040,666

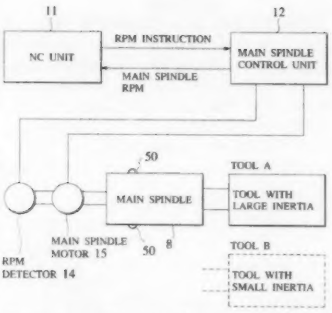
MACHINE TOOL CONTROL SYSTEM AND MACHINE TOOL CONTROL METHOD, AND DETECTION SYSTEM AND DETECTION METHOD THEREFOR

Hirohiko Honda, and Yoshinobu Kato, both of Shizuoka-ken, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1998, Appl. No. 126,108
Claims priority, application Japan, Jul. 31, 1997, 9-220252
Int. Cl.[7] H02P *1/00*
U.S. Cl. 318—276 **6 Claims**

1. A control system for a machine tool having a spindle with a tooling body mounted thereon, the control system comprising:

a first detector for detecting an acceleration time for the tooling body to reach from a rotation start to a predetermined number of revolutions per unit time;



a controller for controlling a number of revolutions per unit time of the spindle under a first lowered limit when the acceleration time is longer than a reference line;

a second detector for detecting an asymmetricity of radial forces acting on the spindle; and

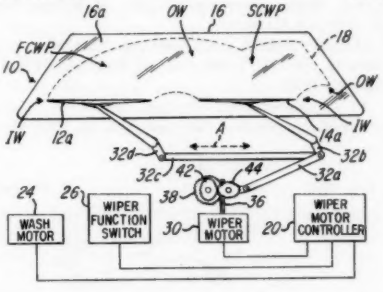
wherein the controller controls the number of revolutions per unit time of the spindle under a second lowered limit when the asymmetricity of radial forces exceeds a reference degree.

6,040,667

SYSTEM AND METHOD FOR DRIVING WIPERS IN A WINDSHIELD WIPER SYSTEM

John Christopher Watts, Gates Mills, Ohio, assignor to Valeo Elecrical Systems, Inc., Auburn Hills, Mich.

Filed Dec. 12, 1995, Appl. No. 570,914
Int. Cl.[7] H02P *1/00*
U.S. Cl. 318—280 **24 Claims**



1. A wiper system for wiping a windshield, said wiper system comprising:

at least one wiper; and

a driver coupled to said at least one wiper for driving said at least one wiper at a non-linear velocity;

wherein said driver comprises a plurality of elliptical gears, said plurality of elliptical gears mating to cause said at least one wiper to be driven in a generally sinusoidal manner, such that in response to a linear input velocity, said non-linear velocity resulting from rotation of said plurality of elliptical gears and being at least 85%, but not more than 115%, of said linear velocity.

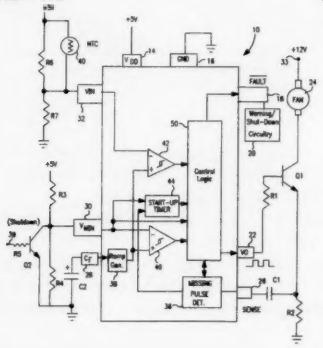
6,040,668
MONOLITHIC FAN CONTROLLER

Quoi V. Huynh, San Jose; Sang T. Ngo, Cupertino, both of Calif.; Joseph James Judkins, III, Cedar Park, and Donald E. Alfano, Round Rock, both of Tex., assignors to TelCom Semiconductor, Inc., Mountain View, Calif.

Filed Nov. 14, 1996, Appl. No. 749,864

Int. Cl.[7] G05B *5/00*

U.S. Cl. 318—471 **21 Claims**



1. A monolithic fan controller comprising:

a driver circuit for providing a pulse train for driving a fan motor, varying said pulse train controlling a speed of said fan motor;

a thermal sense circuit for receiving a signal relating to a temperature and, in response thereto, for varying said pulse train; and

a fan rotation sense circuit for detecting pulses created by fan motor rotation and for generating a signal indicating non-rotation of said fan motor in response to an absence of said detecting pulses.

6,040,669
CONTROL DEVICE FOR AN OPTICAL SENSOR

Norbert Hog, Buehl, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

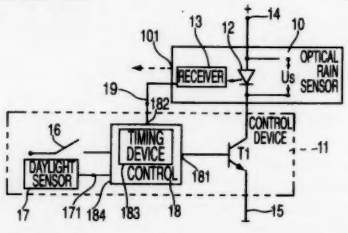
PCT No. PCT/DE97/02097, § 371 Date Jun. 12, 1998, § 102(e) Date Jun. 12, 1998, PCT Pub. No. WO98/17511, PCT Pub. Date Apr. 30, 1998

PCT Filed Sep. 18, 1997, Appl. No. 77,306

Claims priority, application Germany, Oct. 22, 1996, 196 43 465

Int. Cl.[7] G05B *5/00*

U.S. Cl. 318—480 **27 Claims**



1. A control device for an optical sensor, the optical sensor generating a measuring signal and including an optical transmitter, the control device comprising:

an arrangement switching a power of the optical transmitter between a full power and a reduced power as a function of the measuring signal,

wherein, when a pane is dry and only after a predetermined time period, the optical transmitter operates at the reduced power as a function of the measuring signal.

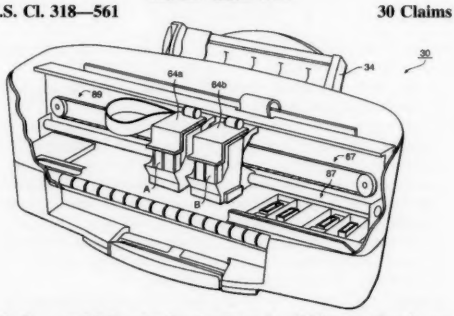
6,040,670
CONTROLLER FOR PRINTER CARRIAGE MOTOR

Masanori Kaneko, Fountain Valley, and Akihiko Sukigara, Irvine, both of Calif., assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1998, Appl. No. 19,189

Int. Cl.[7] H02P *5/06*

U.S. Cl. 318—561 **30 Claims**



1. In a multiple print head printer in which print heads are removable and exchangeable, a method of controlling a printer carriage motor comprising the steps of:

receiving a print job, said print job comprising print commands and print data;

detecting a status of print heads installed in said multiple print head printer;

selecting a motor control function for controlling operational speed and direction of the printer carriage motor based on the detected status of print heads,

wherein the status of print heads installed includes at least a number of print heads currently installed in the multiple print head printer.

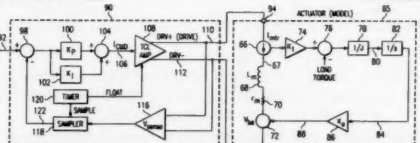
6,040,671
CONSTANT VELOCITY CONTROL FOR AN ACTUATOR USING SAMPLED BACK EMF CONTROL

Joao Carlos F. Brito, Richardson; John K. Rote, Dallas; Frederick W. Trafton, Lewisville, and Marcus M. Martins, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 28, 1999, Appl. No. 239,188

Int. Cl.[7] H02K *23/00;* **H02P** *1/04*

U.S. Cl. 318—603 **10 Claims**



1. An apparatus for controlling an actuator having a moveable member and having a coil that influences movement of the member, by provision of a drive current to said coil in response to a target speed voltage signal, comprising:

an up/down counter, counting at a predetermined count rate and providing a count output;

a control unit for controlling the direction of count of said up/down counter depending on whether the voltage across said coil, sensed periodically a first predetermined interval after said drive current to said coil is interrupted, is greater

than, or less than, a reference voltage having a predetermined relationship to said target speed voltage;

a digital-to-analog converter responsive to said count output to provide a compensated voltage signal having a voltage corresponding to said count output;

a voltage sensing and holding unit that periodically, after said drive current is interrupted for a second predetermined interval, senses and holds a sample voltage corresponding to the voltage across said coil;

a plus/minus indicator that senses when said up/down counter is in a down count direction and is at a count of zero, and in response thereto changes between a plus state and a minus state;

a switch node combining said sample voltage signal with said compensated voltage signal to produce a command voltage signal, and providing said command voltage signal with a polarity controlled by the state of said plus/minus indicator; and

a transconductance amplifier unit, receiving said command voltage signal and providing said drive current to said coil in a direction determined by the state of said plus/minus indicator.

6,040,672

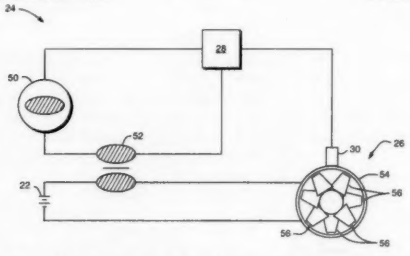
ELECTROACTIVE WAVEFORM CONTROL DEVICE AND RELATED METHOD

Gregg W. Schudel, McLean, Va., and J. Scott Knight, Stonington, Conn., assignors to GTE Internetworking Incorporated, Burlington, Mass.

Filed Dec. 18, 1998, Appl. No. 216,072

Int. Cl.[7] **G05B** *5/01*

U.S. Cl. 318—611 **18 Claims**



1. A machine having a noise reduction apparatus and having an electric motor powered by a drive current from a power source, wherein operation of the machine causes the machine to emit vibrational noise, the vibrational noise inducing a waveform in the drive current, the apparatus comprising:

an input device for measuring the vibrational noise and for quantifying the induced waveform;

a signal processor operably coupled to the input device and for producing a control signal as a function of the quantified induced waveform; and

a control device coupled between the signal processor and the electric motor, the control device being operable to add the control signal to the drive current, to reduce the vibrational noise generated by the machine.

6,040,673

MOTOR CONTROL APPARATUS

Yoshinori Isomura; Masahiro Yasohara, both of Hyogo-ken, and Kazuyuki Takada, Osaka-fu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed May 27, 1999, Appl. No. 320,735

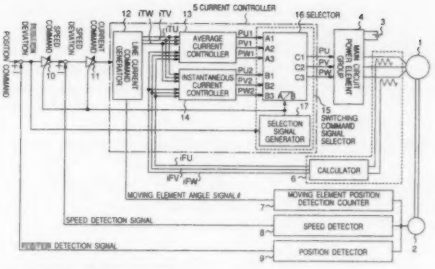
Claims priority, application Japan, May 29, 1998, 10-148958

Int. Cl.[7] **G05B** *5/01*

U.S. Cl. 318—615 **20 Claims**

1. A motor control apparatus comprising:

a motor;



a main circuit dc source;

a main circuit power element group for supplying power from the main circuit dc source to a drive coil of the motor;

a line current detector for detecting a line current flowing to a drive coil of the motor, and outputting the detected line current as a line current measurement;

a position detector for detecting movement of a moving element of the motor; and

a current controller for controlling the line current so that movement detected by the position detector equals a desired value by applying a switching command signal to the main circuit power element group, the switching command signal being dependent upon a position deviation, which is a difference between movement detected by the position detector and the desired movement;

wherein said current controller comprises:

a line current command generator for outputting based on the position deviation a command signal indicative of a line current to flow to the motor;

an average current controller for comparing a PWM carrier signal and a voltage command signal obtained by amplifying a difference between the line current measurement and line current command signal, and outputting a first switching command signal;

an instantaneous current controller for outputting a second switching command signal based on a comparison of the line current measurement and line current command signal; and

a switching command signal selector for selecting and outputting to the main circuit power element group as the switching command signal either the first switching command signal or second switching command signal; and

the switching command signal selector selects as the switching command signal the first switching command signal when the position deviation is within a specified range, and selects the second switching command signal when the position deviation is outside this specified range.

6,040,674

MOTOR DRIVING DEVICE, METHOD OF ADJUSTING THE SAME, AND INFORMATION STORAGE DEVICE

Masatsugu Nishida; Toru Ikeda, and Tomoki Yokoyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 16, 1999, Appl. No. 354,893

Claims priority, application Japan, Feb. 19, 1999, 11-042292

Int. Cl.[7] **H02P** *8/00;* **G11B** *5/58*

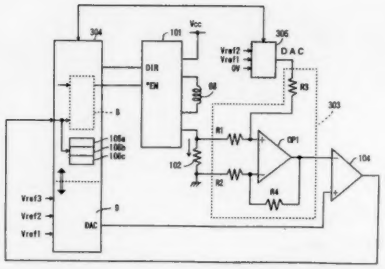
U.S. Cl. 318—632 **20 Claims**

7. A motor driving device comprising:

a current detection unit which detects a current flowing in a motor;

a comparator unit which compares the current detected by the current detection unit with a current indication value to generate a comparison signal;

a current control unit which controls the current flowing in the motor in accordance with a comparison result from the comparator unit; and



a zero-level adjustment unit which detects the comparison signal while varying the current indication value or while varying a bias voltage of the current detection signal, and sets a zero level of the current indication value based on a variation of the comparison signal.

6,040,675

SUPPORTING APPARATUS USING MAGNETIC POWER

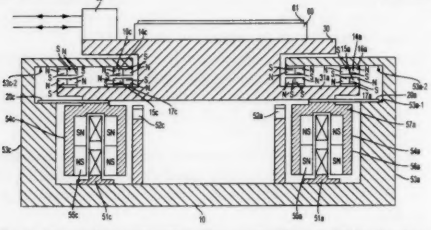
Kazuya Ono, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 6, 1997, Appl. No. 870,982

Claims priority, application Japan, Jun. 7, 1996, 8-146031

Int. Cl.[7] H01L *21/68*

U.S. Cl. 318—649 **46 Claims**



1. A supporting apparatus for supporting a table having N degrees of freedom, where N is an integer greater than one, said apparatus comprising:

a stage;

a leaf spring mounted on said stage and initially contacting said table at a contact point, said leaf spring having a coefficient of elasticity greater in a first direction and smaller in a direction perpendicular to said first direction, and having a characteristic of positive rigidity; and

a pair of permanent magnets mounted in an area between said stage and said table, in an arrangement such that magnetic poles of said permanent magnets oppose each other and are arranged in a direction perpendicular to said first direction, said pair of permanent magnets generating a force that substantially corresponds to the self weight of said table at a neutral position and counterbalancing said characteristic of positive rigidity of said leaf spring.

6,040,676

PASSIVE ELECTRONIC DAMPING FOR STEP MOTOR

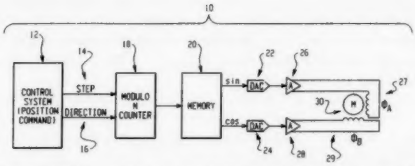
Jack Nordquist, Santa Rosa; Mark J. Calahan, Sebastopol; Timothy J. Damiano, Petaluma, and Christopher M. Botka, Santa Rosa, all of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Provisional application No. 60/010,871, Jan. 31, 1996. This application Jan. 22, 1997, Appl. No. 787,434.

Int. Cl.[7] H02P *8/00*

U.S. Cl. 318—696 **18 Claims**

1. Passive damping apparatus for a step motor of the type having a number of phase windings, comprising: a respective transconductance amplifier coupled to each phase winding for producing a phase drive current in the winding in response to a position command; each transconductance amplifier exhibiting an output impedance including a capacitive reactance and a dissipative resistance in shunt with the phase winding impedance; and means for changing said amplifier output impedance to dissipate resonant energy to effect motor damping.



6,040,677

APPARATUS FOR DRIVING STEPPER MOTOR OF CAMERA

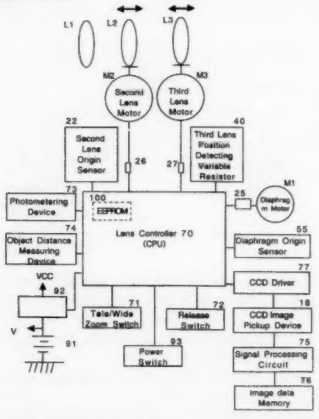
Masahiro Oono, Saitama-ken; Hisao Iwanade, Tokyo; Noboru Saitoh, Saitama-ken; Koji Sato, Saitama-ken; Sukenori Shiba, Saitama-ken; Tatsuya Yoshida, Saitama-ken, and Nobuyuki Nagai, Saitama-ken, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1998, Appl. No. 20,849

Claims priority, application Japan, Feb. 10, 1997, 9-026897

Int. Cl.[7] H02P *8/00*

U.S. Cl. 318—696 **13 Claims**



1. A stepping motor driving apparatus for a camera, comprising:

a digital still camera having an image pickup device, a memory capable of storing image data produced by said image pickup device, and a display capable of displaying said image data;

a 1–2 phase excitation type stepping motor;

said camera having a mode of normal drive control and high precision drive control of said camera;

a drive controller which drives said stepping motor by 1–2 phase excitation;

wherein, when said camera is in said mode of normal drive control responsive to image data being displayed on said display but not being recorded in said memory, said drive controller always stops said stepping motor at a 1-phase excitation position by de-energizing said stepping motor at said 1-phase excitation position, and

wherein, when said camera is in said mode of high precision control responsive to image data being recorded in said memory, said drive controller stops said stepping motor at one of said 1-phase excitation position and a 2-phase excitation position without stopping excitation of said stepping motor.

6,040,678

SWITCHED RELUCTANCE MOTOR HAVING NOISE AND VIBRATION REDUCED

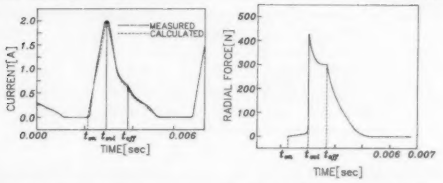
Kyung Bum Huh, Busan, and Kwang Joon Kim, Taejun, both of Rep. of Korea, assignors to Korea Advanced Institute Science and Technology, Taejun, Rep. of Korea

Filed Jun. 24, 1998, Appl. No. 103,978

Claims priority, application Rep. of Korea, Jun. 24, 1997, 97-26966

Int. Cl.[7] H02P *1/46*

U.S. Cl. 318—701 **18 Claims**



1. A switched reluctance motor having a relatively low dominant natural frequency, wherein the motor comprises:

a rotor and a stator;

a first angle associated with a position at which the motor is switched off;

a second angle associated with a position at which an edge of a rotor tooth begins to meet an edge of a stator tooth; and

means for adjusting a difference between said first angle and said second angle such that noise and vibration levels of said motor are minimized.

6,040,679

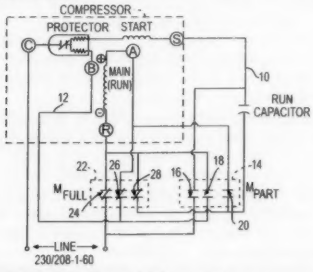
VARIABLE CAPACITY COMPRESSOR HAVING TWO-STEP MOTOR STRENGTH ADJUSTABILITY

David T. Monk, Lebanon; Joe T. Hill, Bristol, both of Va.; Phillip C. Wagner, Bristol, Tenn.; Joseph F. Loprete, Bristol, Tenn., and Michael R. Young, Bristol, Tenn., assignors to Bristol Compressors, Inc., Bristol, Va.

Filed Feb. 6, 1998, Appl. No. 19,834

Int. Cl.[7] H02P *1/26*

U.S. Cl. 318—778 **5 Claims**



1. A control system for a variable capacity compressor having an A/C motor, comprising:

a first circuit having a start winding in series with a capacitor;

a second circuit having a main winding;

a third circuit having said start winding;

a fourth circuit having the main winding in series with said capacitor;

a power supply line connected to each of said circuits to provide power thereto;

a first switch responsive to loading conditions and operable to place the first and second circuits in parallel with the power supply line to run the compressor for high load operation; and

a second switch responsive to loading conditions and operable place the third and fourth circuits in parallel with the power supply line to run the compressor for partial load operation.

6,040,680

RECHARGEABLE BATTERY PACK AND CHARGING STAND FOR CHARGING THE RECHARGEABLE BATTERY PACK BY ELECTROMAGNETIC INDUCTION

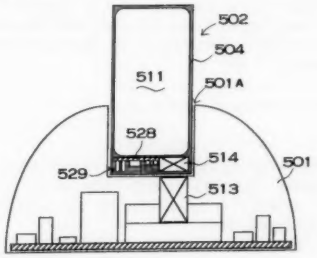
Shoichi Toya, Mihara-gun, and Toshiharu Kokuga, Tsuna-gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 20, 1998, Appl. No. 118,853

Claims priority, application Japan, Jul. 22, 1997, 9-195643

Int. Cl.[7] H01M *10/46*

U.S. Cl. 320—108 **15 Claims**



1. A battery pack comprising:

a rectangular-shaped casing having a rectangular bottom face;

at least one rectangular rechargeable battery disposed within said casing,

wherein a width of said casing is greater than a width of said rectangular rechargeable battery such that a gap is defined between a side face of said casing and an opposing side face of said rectangular rechargeable battery;

a secondary coil disposed in said gap and in close proximity to said bottom face of said casing, said secondary coil having a central axis that is oriented in an elongated direction of said casing; and

a control circuit for controlling electric power induced in said secondary coil for charging said rectangular rechargeable battery contained in said casing.

6,040,681

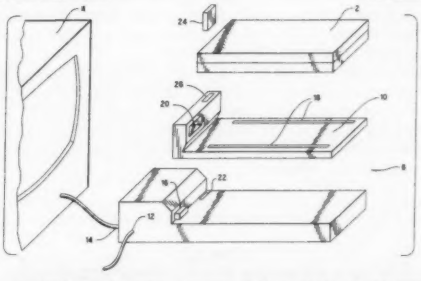
ENHANCED DOCKING TRAY SUPPORTS FOR CUSTOM FEATURING FOR EXTERNAL BATTERY CHARGING FOR NOTEBOOK COMPUTERS

Gregory J. May, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1998, Appl. No. 179,340

Int. Cl.[7] H02J *7/00*

U.S. Cl. 320—113 **20 Claims**



1. A docking apparatus, for use with a piece of equipment selected from a set of pieces of equipment having different physical configurations, each of the pieces of equipment having a respective removable and rechargeable power storage module, the power storage modules of the pieces of equipment having different configurations, for coupling the respective piece of equipment to an equipment interface having a standard physical configuration, the apparatus comprising:

a standard first module including the equipment interface, the first module having a power output interface for coupling with the power storage modules and for providing power to charge the power storage modules; and

a respective second module, selected from a set of second modules which correspond with respective ones of the pieces of equipment, each of the second modules being compatible with the standard first module for coupling therewith, the respective second module being compatible with the respective piece of equipment, the second module including a power storage module receptacle having a configuration which is compatible with the configuration of the power storage module, for receiving the power storage module and coupling the power storage module with the power output interface for recharging.

6,040,682

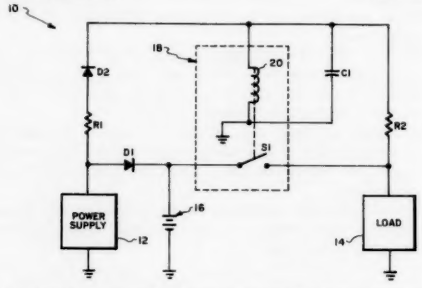
CIRCUIT FOR PREVENTING BATTERY DAMAGE

Fumio Kaneda, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1999, Appl. No. 243,271

Int. Cl.[7] H02J *7/00*

U.S. Cl. 320—136 **15 Claims**



1. A circuit for preventing battery damage to a battery coupled to a load, said circuit comprising:

a battery charger connected to said battery, said battery charger providing a direct current voltage to said battery to maintain a charge on said battery at a predetermined charging voltage;

a relay having a coil and a contact, the contact of said relay having a first terminal connected to said battery and a second terminal connected to said load;

deactivation means connected to the coil of said relay, said deactivation means de-energizing the coil of said relay to open the contact of said relay whenever an output voltage of said battery drops below a predetermined battery cell voltage, said battery being decoupled from said load whenever the contact of said relay is opened; and

activation means connected to the coil of said relay, said activation means energizing the coil of said relay to close the contact of said relay whenever the output voltage of said battery rises to said predetermined charging voltage, said battery being coupled to said load whenever the contact of said relay is closed.

6,040,683

BATTERY CHARGER WITH ACTIVE FEEDBACK VOLTAGE CONTROLLER

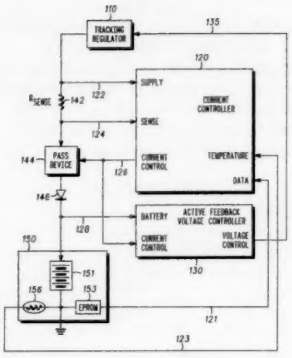
Matthew D. Mottier, Lake Zurich, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 28, 1999, Appl. No. 322,093

Int. Cl.[7] H02J *7/04;7/16*

U.S. Cl. 320—137 **14 Claims**

1. A battery charger with active feedback voltage controller comprising:



a pass device configured for connection between a tracking regulator and a battery pack;

a current controller, coupled to the pass device, for determining a present charging current going to the battery pack and determining a current control value for controlling the pass device based on the present charging current; and

an active feedback voltage controller, coupled to the current controller and configured for connection to the tracking regulator and the battery pack, for receiving the current control value and an actual battery voltage and determining a voltage control value to control an output voltage of the tracking regulator based on the current control value and an actual battery voltage.

6,040,684

LITHIUM ION FAST PULSE CHARGER

Nathan Mitchell, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 30, 1997, Appl. No. 885,049

Int. Cl.[7] H01M *10/46;10/44*

U.S. Cl. 320—139 **18 Claims**

7. A method of charging a lithium-containing battery which has a electrochemically-determined maximum threshold voltage which must not be exceeded, comprising the steps of:

(1.) applying current from a supply voltage which is greater than said threshold voltage, until the voltage seen across the battery reaches a first target voltage which is not substantially greater than said threshold voltage;

(2.) applying intermittent current pulses to said battery from a supply voltage which is greater than said threshold voltage, to intermittently produce a voltage at external terminals of said battery, which is greater than said threshold voltage;

(3.) thereafter operating a pass transistor intermittently as a linear regulator element, to intermittently apply a clamped voltage to said battery which is approximately equal to said threshold voltage; and

(4.) thereafter operating said pass transistor continuously as a linear regulator element to apply a clamped voltage to said battery which is approximately equal to said threshold voltage, wherein said pass transistor is integrated in a single package with said battery.

13. A portable computer system, comprising:

memory, and a microprocessor operatively connected to read said memory, and at least one nonvolatile bulk data storage device, all located within a single chassis;

a battery located within said chassis, and electrically connected to supply power to said memory under at least some circumstances; and

charging circuitry, which operates in a first phase to intermittently apply current pulses to said battery, to intermittently produce a voltage at external terminals of said battery which is greater than a threshold voltage; and

control circuitry which operates in a second phase to operate a pass transistor as a linear regulator element to apply a clamped voltage to said battery which is approximately equal to said threshold voltage, wherein said pass transistor is integrated in a single package with said battery.

6,040,685

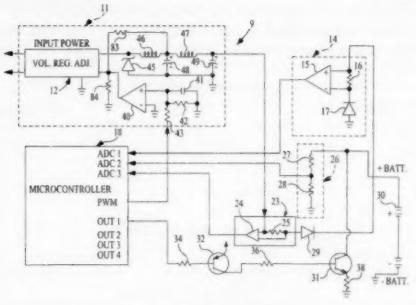
ENERGY TRANSFER AND EQUALIZATION IN RECHARGEABLE LITHIUM BATTERIES

Boris Tsenter, and Mikhail Golod, both of Roswell, Ga., assignors to Total Battery Management, Inc., Chamblee, Ga.

Continuation-in-part of application No. 08/771,030, Dec. 20, 1996, Pat. No. 5,729,116, which is a continuation-in-part of application No. 08/699,130, Aug. 16, 1996, Pat. No. 5,900,718. This application Apr. 10, 1997, Appl. No. 838,570. This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01M *10/44*

U.S. Cl. 320—160 **21 Claims**



1. A method of charging a rechargeable lithium battery comprising:

charging the battery with a charging current;

sampling a charging voltage of the battery during charging;

interrupting the charging current periodically to create a current-free period;

sampling an open circuit voltage of the battery during the current-free period;

identifying a potential adverse charging condition within the rechargeable battery from said sampled charging voltage or said sampled open circuit voltage;

lowering the charging current if the potential adverse charging condition is identified;

continuing charging with the charging current if the potential adverse charging condition is not identified; and

terminating charging when the charging current is lowered below a pre-determined minimum level.

6,040,686

LOW NOISE STEP-DOWN SWITCHING REGULATOR CIRCUITS WITH PROGRAMMABLE SLEW RATE LIMITER AND METHODS OF USE

Jeffrey Schenkel, Burlington, Mass., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Jan. 7, 1999, Appl. No. 227,002

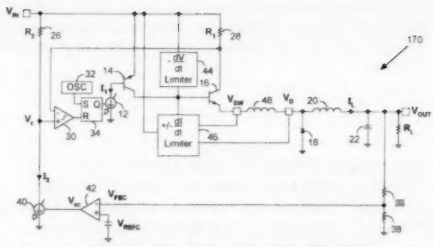
Int. Cl.[7] G05F *1/40*

U.S. Cl. 323—282 **33 Claims**

1. A low noise buck switching regulator that generates an output at an output node from an input at an input node, the regulator comprising:

a switching transistor having a first terminal coupled to the input node, a second terminal, and a third terminal;

an inductor having a first terminal coupled to the third terminal of the switching transistor, and a second terminal coupled to the output node;



a first circuit having a first terminal coupled to the second terminal of the switching transistor, and a second terminal coupled to the input node, the first circuit limiting a voltage slew rate at the third terminal of the switching transistor to a first predetermined value; and

a second circuit having a first terminal coupled to the first terminal of the inductor, a second terminal coupled to the second terminal of the inductor, and an third terminal coupled to the second terminal of the switching transistor, the second circuit limiting a current slew rate at the third terminal of the switching transistor to a second predetermined value.

6,040,687

NONLINEAR MULTIPLIER FOR SWITCHING MODE CONTROLLER

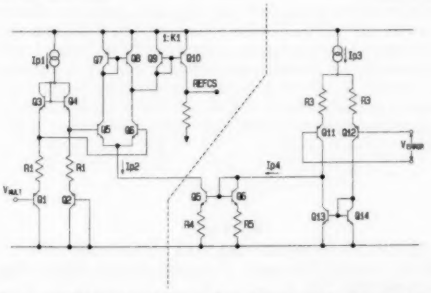
Albino Pidutti, Udine, and Marco Alessandro Legnani, Saronno, both of Italy, assignors to STMicroelectronics S.R.L., Agrate Brianza, Italy

Filed Nov. 5, 1998, Appl. No. 187,084

Claims priority, application European Pat. Off., Nov. 10, 1997, 97830584

Int. Cl.[7] G05F *3/16*

U.S. Cl. 323—316 **19 Claims**



1. A multiplier circuit for a first signal and a second signal according to a multiplying factor proportional to an amplitude of the second signal, said multipler circuit comprising:

a first degenerated differential stage;

a second nondegenerated differential stage;

an output stage comprising a first current mirror and a resistive load connected thereto;

said first degenerated differential stage performing a linear to logarithmic conversion of said first signal for providing an input differential voltage for said second nondegenerated differential stage;

said second nondegenerated differential stage performing a logarithmic to linear conversion of said input differential voltage for providing an input current to said first current mirror; and

means for generating a current proportional to said second signal and forcing said current through said second nondegenerated differential stage, said means for generating a current comprising a second current mirror including a first diode-configured input transistor and a second output transistor, and respective degeneration resistors connecting the first diode-configured input transistor and the second output transistor to

a supply node, an emitter area ratio between said first diode-configured input transistor and second output transistor being different from an emitter area ratio of respective degeneration resistors.

6,040,688

ELECTRICAL CURRENT SUPPLY DEVICE WITH INCORPORATED ELECTRICAL CURRENT SENSOR

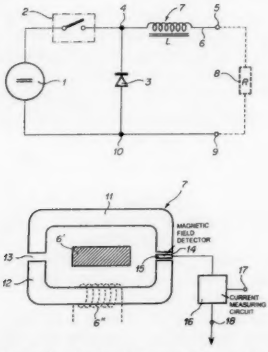
Pierre Strübin, Bellevue, Switzerland, assignor to Liaisons Electronique - Mecaniques Lem S.A., Switzerland

Filed Dec. 10, 1998, Appl. No. 209,394

Claims priority, application Switzerland, Jan. 28, 1998, 0207/98

Int. Cl.[7] H03H *1/00*

U.S. Cl. 323—368 **5 Claims**



1. A current supply device for supplying a direct current, a sinusoidal current or a pulsed current to a load, said device comprising a conductor portion and a self-induction means connected in series with said load, said self-induction means adapted to smooth said current or absorb transient current wherein said self-induction means comprises a magnetic circuit coupled with said conductor portion and having at least one air-gap, a magnetic field detector device being arranged in said air-gap and being connected to a measuring or control circuit for producing an output signal representing the current supplied by said current supply device.

6,040,689

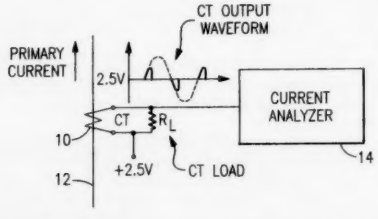
CURRENT SENSING METHOD AND APPARATUS

Andrew Gluszek, Liverpool, N.Y., assignor to SSAC, Inc., Baldwinsville, N.Y.

Filed Jun. 17, 1997, Appl. No. 877,281

Int. Cl.[7] G01R *19/10*

U.S. Cl. 324—127 **48 Claims**



1. A current sensing apparatus for sensing current in a conductor, said apparatus comprising:

a current transformer disposed in electrical communication with said conductor, said current transformer having a secondary current output waveform;

a current analyzing means in communication with said current transformer, said current analyzing means including

selecting means for selecting at least two data points in an undistorted region of said secondary current output waveform, wherein said selecting means selects a point at which said secondary current reaches a predetermined deviation from a sinewave as one of said data points; and

estimating means for estimating characteristics of said conductor current based on said selected data points.

6,040,690

ELECTRICITY MEASUREMENT USING TWO CONDUCTORS

David Anthony Ladds, Bath, United Kingdom, assignor to Horstmann Timers & Controls Limited, United Kingdom

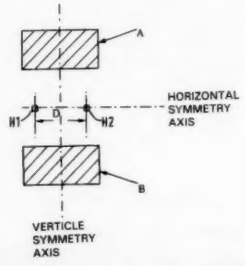
PCT No. PCT/GB96/00040, § 371 Date Oct. 28, 1997, § 102(e) Date Oct. 28, 1997, PCT Pub. No. WO96/22539, PCT Pub. Date Jul. 25, 1996

Continuation of application No. PCT/GB96/00040, Jan. 10, 1996. This PCT application Jan. 10, 1996, Appl. No. 875,031.

Claims priority, application United Kingdom, Jan. 18, 1995, 9500974

Int. Cl.[7] G01R *19/00*

U.S. Cl. 324—142 **22 Claims**



1. An electricity measurement apparatus comprising:

two spaced-apart parallel conductors through which current flows in a same direction, a magnetic field being induced in the space at least substantially between the conductors,

two magnetic field sensors disposed in the space, the sensors disposed one on each side of a first plane in which the conductors lie, the sensors providing signals representative of measured field strengths,

and an arithmetic processor provided to process the signals to provide a value representative of current flow, said value being dependent on the current flow in each conductor,

in which the two sensors are positioned in a second plane passing between the conductors and perpendicular to the first plane, the provided value representative of current flow being substantially independent of the position of the second plane within the space between the conductors.

6,040,691

TEST HEAD FOR INTEGRATED CIRCUIT TESTER ARRANGING TESTER COMPONENT CIRCUIT BOARDS ON THREE DIMENSIONS

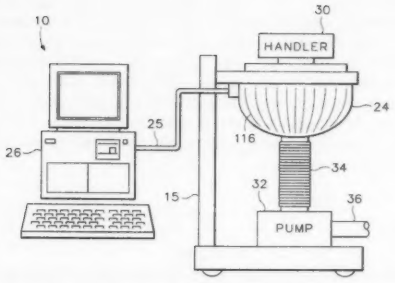
John C. Hanners, Brentwood; Charles A. Miller, and Dean Stanford, both of Fremont, all of Calif., assignors to Credence Systems Corporation, Fremont, Calif.

Filed May 23, 1997, Appl. No. 862,596

Int. Cl.[7] G01R *31/02*

U.S. Cl. 324—158.1 **35 Claims**

1. A test head for an electronic circuit tester of the type having a plurality of tester nodes, each tester node communicating with a device under test (DUT) during a test via a separate test signal, the test head comprising:



a plurality of node cards, each having a first planar surface holding at least one of said tester nodes;

a plurality of daughterboards, each having connectors on a second planar surface holding a plurality of said node cards;

a DUT interface board for holding said DUT, said DUT interface board having a third planar surface containing a plurality of contact pads and having means for conveying test signals between said DUT and said contact pads; and

means for holding said daughterboards such that each daughterboard contacts a separate subset of said contact pads and such that their second planar surfaces lie in separate planes intersecting at a single common axis perpendicular to said third planar surface of said DUT interface board.

6,040,692

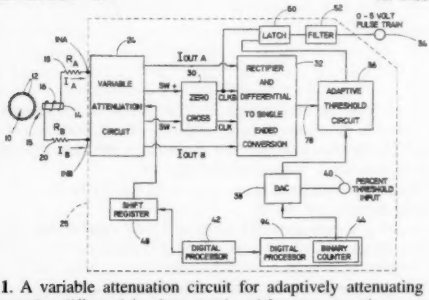
VARIABLE ATTENUATION CIRCUIT FOR A DIFFERENTIAL VARIABLE RELUCTANCE SENSOR USING CURRENT MODE

Gregory Jon Manlove, and Mark Billings Kearney, both of Kokomo, Ind., assignors to Delco Electronics Corporaiton, Kokomo, Ind.

Filed May 18, 1998, Appl. No. 80,383

Int. Cl.[7] **G01P** *3/488;3/489;* **H03L** *5/00;* **G01R** *15/08*

U.S. Cl. 324—173 **11 Claims**



1. A variable attenuation circuit for adaptively attenuating an alternating differential voltage produced from a magnetic sensor in response to rotation of a wheel, comprising:

an input circuit for receiving an input alternating differential voltage from a magnetic sensor via first and second input lines, said input circuit including first and second resistors coupled to said first and second input lines, respectively;

a first current sourcing circuit coupled to said first input line for sourcing current to maintain a fixed voltage at said first input line and provide a first current, said first current sourcing circuit including a first plurality of selectable current sourcing branches for attenuating said first current;

a second current sourcing circuit coupled to said second input line for sourcing current to maintain a fixed voltage at said second input line and provide a second current, said second current sourcing circuit including a second plurality of selectable current sourcing branches for attenuating said second current;

switching circuitry for controlling selection of pairs of said first and second plurality of current sourcing branches so as to provide selectable amounts of current sourcing to attenuate the first and second currents;

a controller for adaptively selecting combinations of said current sourcing branches to attenuate the differential first and second currents in said first and second current sourcing circuits as needed to maintain the differential current within a preferred range; and

an output for providing a differential output current to achieve rotational speed information about said wheel.

6,040,693

USER INITIATED MAGNETIC HEAD WEAR MEASURING AND DISPLAY SYSTEM

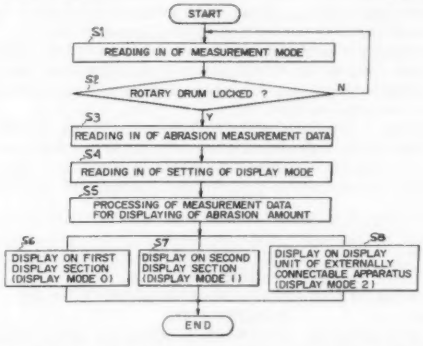
Seiichi Sakai, Tokyo; Teruyuki Yoshida, and Fumiyoshi Abe, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 20, 1997, Appl. No. 879,793

Claims priority, application Japan, Jun. 27, 1996, 8-167516

Int. Cl.[7] **G11B** *5/00;* **G01R** *33/12;* **G01N** *27/72*

U.S. Cl. 324—210 **14 Claims**



1. A magnetic recording and reproducing apparatus in which a magnetic head contacts a recording medium to record or reproduce a signal onto or from the recording medium, said apparatus comprising:

measurement means for measuring an abrasion amount of said magnetic head and outputting measurement data;

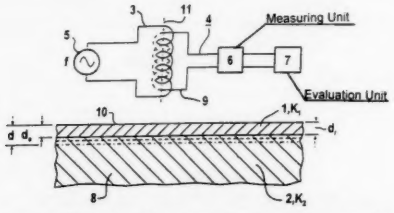
display means for displaying the abrasion amount of said magnetic head represented by the measurement data outputted from said measurement means; and

switch means operable by a user of the apparatus for causing said measurement means to measure said abrasion amount of said magnetic head, wherein said display means selectively displays a first mode wherein the abrasion amount of said magnetic head is displayed by lighting or blinking of a plurality of light emitting diodes, a second mode wherein the abrasion amount of said magnetic head is displayed in a form of a graph having a starting point which represents that said magnetic head is abraded little and an end point representative of a limit of use of said magnetic head, and a third mode wherein the abrasion amount of said magnetic head is displayed in the form of a numerical value.

6,040,694
METHOD AND DEVICE FOR DETERMINING THE THICKNESS OF AN ELECTRICALLY CONDUCTIVE LAYER

Erich Becker, Marl, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of application No. PCT/DE96/02383, Dec. 10, 1996. This application Jun. 22, 1998, Appl. No. 103,161.
Claims priority, application Germany, Dec. 22, 1995, 195 48 508
Int. Cl.[7] **G01B** *7/06;101/00;121/02;* **G01R** *33/12*
U.S. Cl. 324—230 **12 Claims**



1. A method for determining a thickness of a protective layer of a component, which comprises:

providing a component having a protective layer with an electrical conductivity κ_1 and a base material with an electrical conductivity κ_2, the protective layer disposed on the base material and the electrical conductivity κ_1 and the electrical conductivity κ_2 being different from each other;

applying a high-frequency electric current to an excitation coil, the excitation coil being coupled to a probe coil;

moving the excitation coil near to the protective layer to produce an electric eddy current in at least the protective layer;

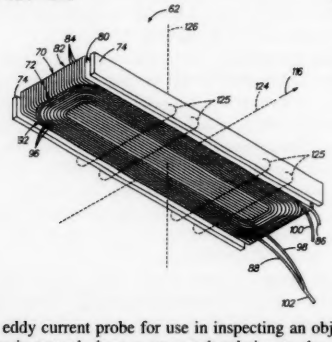
determining a parameter related to an impedance of the probe coil, using the determined parameter, according to an eddy-current testing principle, as a basis for determining a thickness of the protective layer; and

selecting a frequency of the high-frequency electric current, based on the eddy-current testing principle, to unambiguously determine the thickness of the protective layer where a ratio κ_2/κ_1 of the electrical conductivities is between 0.7 and 1.5.

6,040,695
METHOD AND APPARATUS FOR INSPECTION OF COMPONENTS

David A. Raulerson, Palm Beach Gardens; Jay Amos, Hobe Sound, and Kevin D. Smith, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1997, Appl. No. 996,127
Int. Cl.[7] **G01R** *33/12;* **G01N** *27/72*
U.S. Cl. 324—240 **29 Claims**



1. An eddy current probe for use in inspecting an object, where the probe is moved along a scan path relative to the object, the probe comprising:

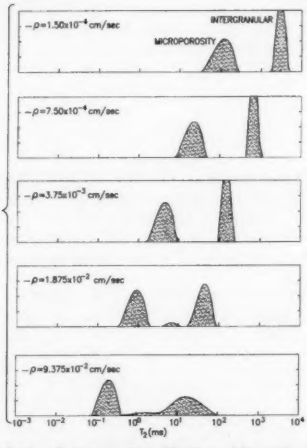
a driver having a coil with an effective coil axis, said driver having a length and a width, said length being the dimension in a direction substantially parallel to the scanning path; and

a receiver having a coil with a coil axis oriented substantially perpendicular to said driver coil effective coil axis, said receiver having a length, a width, and a thickness, said length being the dimension in the direction parallel to the scanning path, said width having a dimension substantially greater than that of said length.

6,040,696
METHOD FOR ESTIMATING PORE STRUCTURE IN CARBONATES FROM NMR MEASUREMENTS

Terizhandur S. Ramakrishnan, Bethel; Lawrence M. Schwartz, Westport; Edmund J. Fordham, Danbury; William E. Kenyon, and David J. Wilkinson, both of Ridgefield, all of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Sep. 16, 1997, Appl. No. 932,141
Int. Cl.[7] **G01V** *3/00*
U.S. Cl. 324—303 **19 Claims**



1. A method of interpreting Nuclear Magnetic Resonance (NMR) data to determine the pore geometry of microporous carbonate rock, by estimating porosity components and their volume to surface area ratios, comprising the steps of:

a) obtaining a measurement of a transverse magnetization relaxation decay curve, $M_d(t)$;

b) utilizing a parameterized physical model representing the pore geometry and diffusion of magnetization between pore components in order to predict magnetization, M(t); and

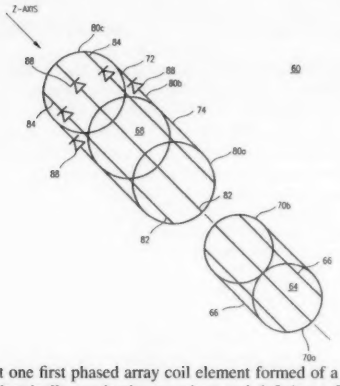
c) inferring porosity components of microporous carbonate rock and their relevant volume to surface area ratios or pore sizes by comparing said magnetization M(t) with said transverse magnetization relaxation decay curve, $M_d(t)$.

6,040,697
MAGNETIC RESONANCE IMAGING RECEIVER/ TRANSMITTER COILS

George J. Misic, Allison Park, Pa., assignor to Medrad, Inc., Indianola, Pa.

Filed Nov. 26, 1997, Appl. No. 979,842
Int. Cl.[7] **G01V** *3/00*
U.S. Cl. 324—318 **22 Claims**

1. A magnetic resonance imaging coil system for forming images of regions of interest, comprising,:



at least one first phased array coil element formed of a plurality of electrically conductive members and defining a first array volume;

at least one extension element operably associated with said at least one first phased array coil element for extending said at least one first phased array coil element to define a further array volume;

at least one second phased array coil element formed of a second plurality of electrically conductive members and defining a second array volume, said at least one second phased array coil element disposed at least partially within said first and further array volumes;

said at least one first phased array coil element and said at least one extension element being adapted to apply a first magnetic field to at least said first and further array volumes; and

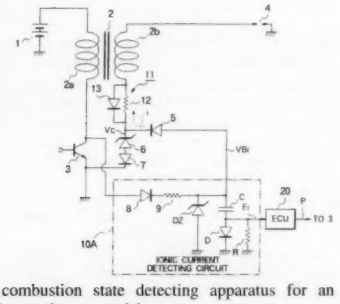
said at least one first and second phased array coil elements being further adapted to receive a second magnetic field generated by a subject in response to said first magnetic field.'

6,040,698

COMBUSTION STATE DETECTING APPARATUS FOR AN INTERNAL-COMBUSTION ENGINE

Yasuhiro Takahashi, and Wataru Fukui, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1997, Appl. No. 890,020
Claims priority, application Japan, Feb. 18, 1997, 9-033965
Int. Cl.[7] F02P *17/00*
U.S. Cl. 324—399 **5 Claims**



1. A combustion state detecting apparatus for an internal-combustion engine, comprising:

an ignition coil composed of a transformer which has a primary winding and a secondary winding, and which generates a high voltage for ignition at a high voltage end of the secondary winding when supply of current to the primary winding is cut off;

a spark plug, comprising opposed electrodes, connected to the high voltage end of the secondary winding and which discharges under application of a high voltage for ignition to ignite a fuel-air mixture in a cylinder of the internal-combustion engine;

an ionic current detecting circuit which includes biasing means connected to a low voltage end of the secondary winding and which detects ionic current flowing from the biasing means via the spark plug after the combustion of the fuel-air mixture;

rectifying means, inserted between the biasing means and the low voltage end of the secondary winding, for controlling flow of the ionic current in a forward direction;

voltage clamping means, inserted between the low voltage end of the secondary winding and ground; and

an ECU which detects a combustion state at the spark plug according to the ionic current;

wherein the biasing means applies a bias voltage of a polarity opposite to the high voltage for ignition to the spark plug via the rectifying means and the secondary winding; and

the voltage clamping means limits the voltage at the low voltage end of the secondary winding to a predetermined value when the high voltage for ignition appears;

an absolute value of the predetermined value being set to the absolute value or more of the bias voltage of the biasing means,

and wherein:

current limiting means is installed between the junction of the rectifying means and the voltage clamping means and the low voltage end of the secondary winding; and

the current limiting means controls the current flowing from the biasing means to the spark plug via the secondary winding so as to control the voltage at the high voltage end of the secondary winding when current begins to be supplied to the primary winding,

and wherein the current limiting means comprises a resistor and a diode connected in parallel to each other; and

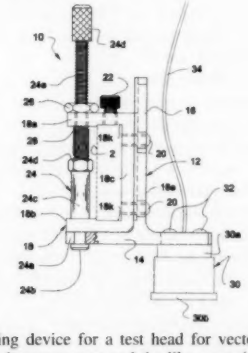
the diode sets the direction of the secondary current flowing through the secondary winding at the time of applying the high voltage for ignition to the forward direction so as to suppress a potential difference across the resistor during ignition control.

6,040,699

MOUNTING APPARATUS FOR VECTORLESS TESTING

Frederick J. Holmes, Plainville, Mass., assignor to Semco Machine Corporation, Wrentham, Mass.

Filed Jun. 16, 1997, Appl. No. 877,032
Int. Cl.[7] G01R *31/22*
U.S. Cl. 324—754 **16 Claims**



1. A mounting device for a test head for vectorless testing of integrated circuit components and the like comprising

a mounting member having a first laterally extending base leg, a test head seat formed on the first leg for mounting the test head, a second leg extending upwardly from the first leg along a length to a distal end, at least one slot formed through the second leg and extending along a portion of the length of the second leg,

a generally U-shaped bracket having upper and lower arms extending from a bight portion and guide projections extending from the bight portion and received in the at least one slot, a threaded bore formed through the upper arm and a smooth bore formed through the lower arm,

a pin member having opposite ends and a longitudinal axis, a threaded portion extending along the longitudinal axis to a distal free end, the threaded portion threadingly received in the threaded bore in the upper arm and the pin member slidingly received through the bore in the lower arm with the other end of the pin member rotatably attached to the base leg, whereby rotating movement of the threaded portion will cause vertical (z) movement of the mounting member and concomitantly the seat.

6,040,700

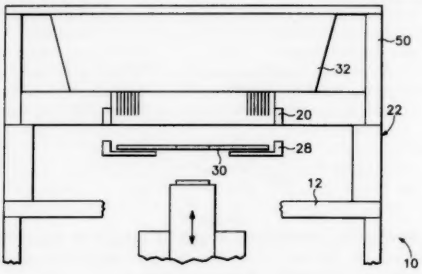
SEMICONDUCTOR TESTER SYSTEM INCLUDING TEST HEAD SUPPORTED BY WAFER PROBER FRAME

Andrei Berar, Campbell, Calif., assignor to Credence Systems Corporation, Fremont, Calif.

Filed Sep. 15, 1997, Appl. No. 929,502

Int. Cl.[7] G01R *31/02*

U.S. Cl. 324—754 **14 Claims**



1. A semiconductor tester for testing a semiconductor device in wafer form, comprising:

a wafer prober including a wafer prober frame, a chuck for holding a wafer under test and a displacement mechanism for displacing the chuck upward relative to the wafer prober frame toward a test station,

a mechanical interface member,

an interface member support structure mounted on the wafer prober frame for supporting the mechanical interface member, the interface member support structure being adjustable, whereby the orientation of the interface member relative to the prober frame can be adjusted,

a test head having test head terminals distributed over a test face,

a test head mounting structure to which the test head is rigidly attached, the test head mounting structure being fixed to and supported by the wafer prober frame, independently of the mechanical interface member, with the test face oriented toward the chuck and the entire weight of the test head being carried by the prober frame,

a probe card, and

a probe card latching mechanism for releasably attaching the probe card to the mechanical interface member at a location in which the probe card engages the test head terminals and the wafer under test engages the probe card when at the test station.

6,040,701

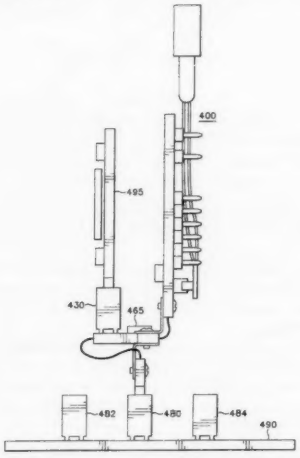
THIN PROFILE VERTICALLY ORIENTED PROBE ADAPTER

M. David Swafford, Hillsboro, and James M. Fenton, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 17, 1998, Appl. No. 99,076

Int. Cl.[7] G01R *31/02*

U.S. Cl. 324—754 **2 Claims**



1. A probe adapter for providing a testing interface between a circuit board under test and a test instrument, comprising:

a first rigid circuit board member for connecting to a first receptacle on a motherboard;

a second rigid circuit board member mounted perpendicular to said first rigid circuit board member for supporting a second receptacle for receiving a circuit under test and supporting said circuit test in a vertical orientation parallel to said first rigid circuit board member;

a first flexible circuit board member for connecting signals between said first and second rigid circuit board members,

a third rigid circuit board member for coupling signals from said receptacle supporting said circuit board under test to said test instrument; and

a second flexible circuit board member for coupling signals between said second and third rigid circuit board members.

6,040,702

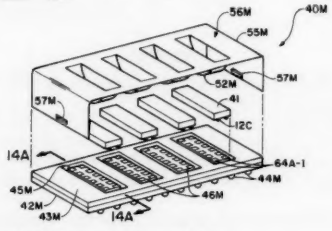
CARRIER AND SYSTEM FOR TESTING BUMPED SEMICONDUCTOR COMPONENTS

David R. Hembree, Boise; Warren M. Farnworth, Nampa; Alan G. Wood, Boise; Derek Gochnour, Boise, and Salman Akram, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 3, 1997, Appl. No. 888,075

Int. Cl.[7] G01R *31/02*

U.S. Cl. 324—755 **31 Claims**



1. A semiconductor carrier comprising:

a base comprising an external contact, the base configured to retain a semiconductor component comprising a contact bump;

an interconnect on the base comprising a contact member in electrical communication with the external contact configured to electrically contact the contact bump on the component;

a first alignment member on the base comprising a first opening configured to contact an edge of the component to coarse align the contact bump to the contact member;

a second alignment member on the interconnect comprising a second opening configured to contact the contact bump to fine align the contact bump to the contact member; and

a force applying mechanism attached to the base configured to bias the component against the interconnect.

6,040,703

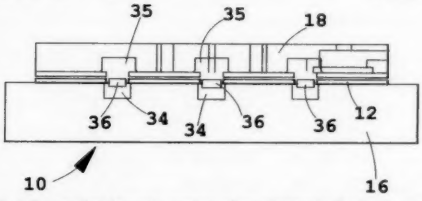
FIXTURE FOR VIBRATION TESTING

David V. Kimball, San Clemente, Calif., assignor to Environmental Screening Technology, Inc., Zeeland, Mich.

Filed Oct. 31, 1997, Appl. No. 962,205

Int. Cl.[7] G01R *31/02*

U.S. Cl. 324—755 **17 Claims**



1. A fixture for dynamic testing of an electronic device having a body and a plurality of electrical leads projecting therefrom, comprising:

first and second dielectric carrier plates;

a fastener for securely fastening the first and second carrier plates together in a predetermined orientation without engaging the body of the electronic device;

at least one of the carrier plates having a plurality of electrical contacts thereon, the plurality of electrical contacts being arranged in a pattern with each of the plurality of electrical contacts corresponding with one of the plurality of electrical leads projecting from the body of the electronic device; and

at least the first carrier plate defining an aperture with a plurality of individually resiliently flexible tabs being defined adjacent the periphery of the aperture, each of the individually flexible tabs corresponding with one of the electrical leads of the electronic device, whereby each of the electrical leads of the electronic device is capable of being securely clasped between one of the resiliently flexible tabs along the periphery of the aperture defined by the first carrier plate and the second carrier plate, and whereby each of the electrical leads of the electronic device is capable of being electrically connected with a corresponding electrical contact on at least one of the carrier plates.

6,040,704

PROBE UNIT AND INSPECTION HEAD

Motoyasu Kondo, Mitaka; Fukuyo Sakuma, Houya; Youichi Urakawa; Yoshihito Yokoyama, both of Chofu, and Masatoshi Hinai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Nihon Micronics, Tokyo, Japan

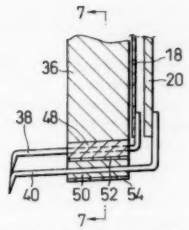
Filed May 16, 1997, Appl. No. 858,019

Claims priority, application Japan, May 24, 1996, 8-151847

Int. Cl.[7] G01R *31/02;1/06*

U.S. Cl. 324—762 **7 Claims**

1. A probe unit comprising:



a support member having an edge extending in a first direction parallel to the surface of a test substance having the shape of a flat plate;

a plurality of conductive needle-like probes disposed on the edge and extended in a third direction intersecting both the first direction and a second direction that is perpendicular to the surface of the test substance, the plurality of probes having axes at intervals in the second direction and being divided into at least a first group and a second group; and

a sheet-like conductive layer being formed between the first and second groups;

wherein the probes of the second group are disposed closer to the test substance than are the probes of the first group.

6,040,705

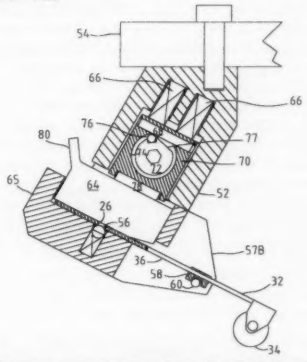
ROLLING ELECTRICAL CONTACTOR

Douglas J. Garcia, Escondido, Calif., and Christian Saulnier, Boutigny, France, assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Provisional application No. 60/056,750, Aug. 20, 1997. This application Feb. 27, 1998, Appl. No. 32,696.

Int. Cl.[7] G01R *1/06*

U.S. Cl. 324—762 **10 Claims**



1. A rolling contactor for providing electrical signal communication between a component terminal and a support structure for said rolling contactor, comprising:

a) electrically conductive means for rolling across the component terminal to communicate one or more signals therewith;

b) a holder connectable to the support structure and in signal communication therewith, the holder comprising:

i) a pair of flanges projecting orthogonally from oposite sides of the arm at said opposite end; and,

ii) a pair of aligned holes defined by respective flanges for journaling the axle ends, the axle being disposed normal to the arm; and,

c) means for resiliently cantilevering the means for rolling from the holder, so as to flex in response to deflection of the means for rolling by a component, said means for cantilevering including means for communicating signals between the means for rolling and the holder, said means for cantilevering said means for rolling comprising:

i) an elongated arm, the arm being electrically conductive to provide signal communication between the means for rolling and the holder;

ii) means for connecting the arm electrically and mechanically at one end to the holder; and,

iii) means for connecting the arm electrically and mechanically at an opposite end to the means for rolling; and,

d) wherein said holder comprises:

i) base means for providing a resting place for an end of the arm remote from the roller means;

ii) means for locating the arm longitudinally and laterally into its resting place; and,

iii) releasable clamping means, acting in opposition to the base means, for holding the arm in its resting place.

6,040,706

CONTACTOR AND SEMICONDUCTOR DEVICE INSPECTING METHOD

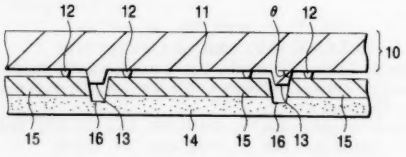
Katsuhiko Tsuura, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Nov. 3, 1997, Appl. No. 963,141

Claims priority, application Japan, Nov. 7, 1996, 8-295077

Int. Cl.[7] G01R *1/02*

U.S. Cl. 324—765 **10 Claims**



1. A contactor for use in testing a plurality of individual semiconductor chips of a semiconductor wafer, said semiconductor wafer being cut so as to at least partially separate said individual semiconductor chips from one another, said contactor comprising:

a plurality of recesses, each of said recessing being substantially equal in size to said individual semiconductor chips;

side walls provided respectively around said recesses; and

a plurality of bump electrodes formed in said recesses in correspondence to a plurality of pad electrodes formed on said individual semiconductor chips,

wherein said side walls are engaged with grooves, said grooves being formed when said semiconductor wafer is cut to at least partially separate said individual semiconductor chips from one another.

6,040,707

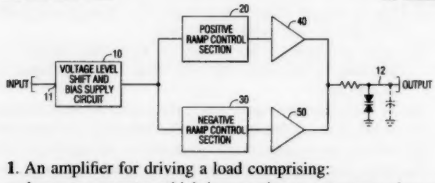
CONSTANT SLEW RATE AMPLIFIER

William R. Young, Palm Bay, Fla., and William B. Shearon, Findlay, Ohio, assignors to Intersil Corporation, Palm Bay, Fla.

Filed Sep. 15, 1997, Appl. No. 929,734

Int. Cl.[7] H03K *17/16*

U.S. Cl. 326—21 **41 Claims**



1. An amplifier for driving a load comprising:

a slew rate generator which is operative to generate a slew rate reference signal that is independent of said load; and

a driver circuit, which is operative to drive said load with an output signal in accordance with an input signal and having a slew rate based upon said slew rate reference signal; and wherein

said slew rate reference signal is a changing voltage, and wherein said driver circuit is operative to drive said load with said output signal that follows said changing voltage and then transitions from said changing voltage to a prescribed output level different from that of said changing voltage.

6,040,708

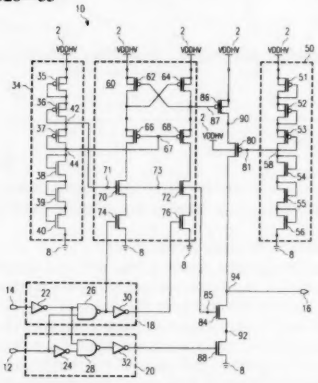
OUTPUT BUFFER HAVING QUASI-FAILSAFE OPERATION

Terence G. W. Blake; Bernhard H. Andresen, both of Dallas, and Frederick G. Wall, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/034,170, Jan. 2, 1997. This application Dec. 30, 1997, Appl. No. 687.

Int. Cl.[7] H03K *17/16*

U.S. Cl. 326—33 **20 Claims**



1. An output buffer coupling a data input and an enable input to an output, the output buffer operable to receive a first voltage from a first power supply and a second voltage from a second power supply, the output buffer comprising:

a first output driver coupled to the output and having a gate oxide protected from voltage changes on the output;

a second output driver coupled to data input, to the enable input, and to the output, the second output driver having a gate oxide protected from voltage changes on the output;

a level shifter coupled to the data input, to the enable input, and to the first output driver, the level shifter having at least one cascode device and operable to switch the first output driver in accordance with the values of the data input and the enable input; and

a bias-generation circuit operable to generate a quasi-failsafe voltage that is approximately equal to the second voltage when the second power supply is supplying the second voltage and equal to a portion of the first voltage when the second power supply is not supplying the second voltage, the bias-generation circuit coupled to a device of the output buffer selected from the group consisting of:

a first output cascode coupled to the first output driver;

a second output cascode coupled to the second output driver; and

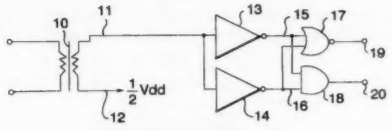
the cascode device of the level shifter.

6,040,709

TERNARY SIGNAL INPUT CIRCUIT

Kazunori Kishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 21, 1998, Appl. No. 82,561
Claims priority, application Japan, May 30, 1997, 9-141696
Int. Cl.[7] H03K *19/01;19/02*
U.S. Cl. 326—59 **4 Claims**



1. A ternary signal input circuit for converting a ternary signal supplied through a transformer into binary signals and outputting the binary signals, comprising:

a first inverter for being supplied with the ternary signal;

a second inverter for being supplied with the ternary signal, said first inverter and said second inverter having opposite hysteresis characteristics, respectively;

a NOR gate for producing an output signal indicative of an inversion of the logical sum of output signals from said first and second inverters; and

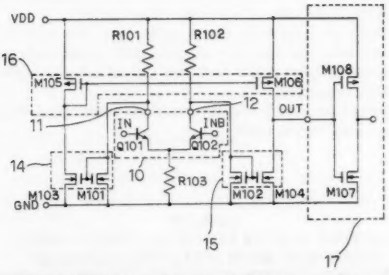
an AND gate for producing an output signal indicative of the logical product of output signals from said first and second inverters.

6,040,710

CML-CMOS CONVERSION CIRCUIT

Osamu Nakauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 4, 1998, Appl. No. 92,012
Claims priority, application Japan, Jun. 5, 1997, 9-148104
Int. Cl.[7] H03K *19/0175*
U.S. Cl. 326—66 **6 Claims**



1. A CML-CMOS conversion circuit that converts input signals complementary-inputted at CML (Current Mode Logic) amplitude into signals of CMOS (Complementary Metal Oxide Semiconductor) logic amplitude and outputs a result, comprising:

a differential circuit that is connected to resistors that function as load and that amplifies and complementary-outputs a difference in potential between a positive input signal, which is one signal of said input signals, and an inverted input signal, which is another signal of said input signals;

a first current mirror circuit that is connected to one output of said differential circuit;

a second current mirror circuit that is connected to the other output of said differential circuit;

a third current mirror circuit that is provided with a first transistor connected in a series to the output of said first current mirror circuit and a second transistor connected in a series with the output of said second current mirror circuit, wherein said second transistor enters a conductive state when current flows to said first transistor and said second transistor enters a nonconductive state when current does not flow to said first transistor; and

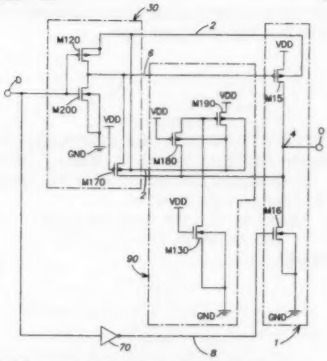
a CMOS inverter that is provided with a p-channel MOS transistor and a first n-channel MOS transistor that are in complementary connection, that takes as input a signal outputted from said second current mirror circuit, and that outputs a signal at CMOS logic amplitude.

6,040,711

CMOS OUTPUT BUFFER HAVING A SWITCHABLE BULK LINE

Maria Leena Airaksinen, Tremestieri Etneo, and Giorgio Catanzaro, Messina, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Continuation-in-part of application No. 08/623,317, Mar. 26, 1996, Pat. No. 5,852,382. This application Jun. 26, 1996, Appl. No. 670,000.
Claims priority, application European Pat. Off., Mar. 31, 1995, 95830120
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H03K *19/0185*
U.S. Cl. 326—81 **16 Claims**



5. A CMOS output buffer circuit comprising:

a final amplifier stage that includes a pull-up transistor and a pull-down transistor connected between a voltage supply terminal having a supply voltage and a ground terminal and sharing a common output node, the pull-up transistor having a bulk electrode connected to a switchable bulk line;

an auxiliary circuit to selectively couple the switchable bulk line to the voltage supply terminal as long as a voltage of the output node is not higher than the supply voltage, and to selectively decouple the switchable bulk line from the voltage supply terminal when the voltage of the output node exceeds the supply voltage;

a first logic gate to drive the pull-down transistor, a control terminal of the first logic gate to receive the input data signal; and

a second logic gate to drive the pull-up transistor, the second logic gate including a first transistor having:

a control terminal to receive the input data signal;

a first terminal connected to the switchable bulk line; and

a second terminal to control the pull-up transistor,

wherein the second terminal of the first transistor is coupled to the output node of the final amplifier stage, and

wherein the second logic gate is operative to transfer the voltage on the output node of the final amplifier stage to the switchable bulk line when the voltage of the output node exceeds the supply voltage.

6,040,712

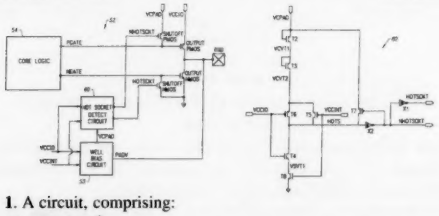
APPARATUS AND METHOD FOR PROTECTING A CIRCUIT DURING A HOT SOCKET CONDITION

Manuel Mejia, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.

Provisional application No. 60/110,260, Nov. 30, 1998. This application May 24, 1999, Appl. No. 317,710.

Int. Cl.[7] H03K *19/0175*

U.S. Cl. 326—82 **20 Claims**



1. A circuit, comprising:

an output node;

a set of transistors operative to control the signal level on said output node;

a first voltage supply;

a second voltage supply; and

a hot socket detection circuit to identify when said first voltage supply or said second voltage supply is below a predetermined value indicative of a hot socket condition, and in response thereto, generate control signals that place said set of transistors in a high impedance state.

6,040,713

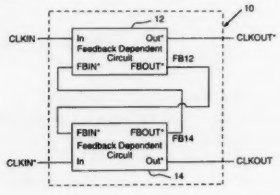
BUFFER WITH FAST EDGE PROPAGATION

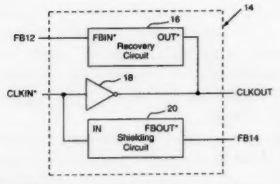
John D. Porter, Meridian; Larren G. Weber, Caldwell, and William N. Thompson, Meridian, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Apr. 22, 1998, Appl. No. 64,531

Int. Cl.[7] H03K *19/0175;19/094*

U.S. Cl. 326—83 **31 Claims**





1. A buffer having first and second input terminals and first and second output terminals, comprising:

a first fast edge driver having an input terminal and an output terminal, said input terminal connected to the first input terminal of the buffer, and said output terminal connected to the first output terminal of the buffer;

a first shielding circuit having an input terminal and an output terminal, said input terminal connected to the first input terminal of the buffer;

a first recovery circuit having an input terminal and an output terminal, said output terminal connected to the first output terminal of the buffer;

a second fast edge driver having an input terminal and an output terminal, said input terminal connected to the second input terminal of the buffer, and said output terminal connected to the second output terminal of the buffer;

a second shielding circuit having an input terminal and an output terminal, said input terminal connected to the second input terminal of the buffer, and said output terminal connected to said input terminal of said first recovery circuit; and

a second recovery circuit having an input terminal and an output terminal, said input terminal connected to said output terminal of said first shielding circuit, and said output terminal connected to the second output terminal of the buffer.

6,040,714

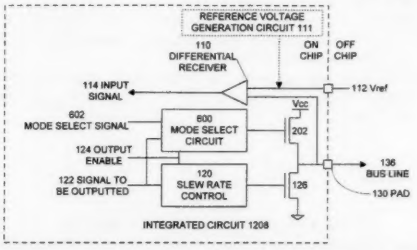
METHOD FOR PROVIDING TWO MODES OF I/O PAD TERMINATION

Dean A. Klein, Eagle, Id., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Dec. 12, 1997, Appl. No. 990,057

Int. Cl.[7] H03K *19/0175;17/16*

U.S. Cl. 326—86 **13 Claims**



1. A method of providing a dual mode output signal for an integrated circuit, comprising:

receiving an output mode signal indicating a first output mode or second output mode;

wherein receiving the output mode signal includes sampling a specific pin on the integrated circuit during system reset to determine the state of the output mode signal;

providing an open drain output signal including activating a pullup transistor for one clock cycle if the output mode signal indicates the first output mode and a signal to be outputted has a high value; and

providing a totem pole output signal if the mode signal indicates the second output mode.

6,040,715

OUTPUT BUFFER CONTROL CIRCUIT THAT PERFORMS HIGH SPEED OPERATION BY GENERATING A PREDETERMINED WIDTH OF A PULSE BASED ON AN OUTPUT CONTROL SIGNAL

Hee-Bok Kang, Daejeon, and Dae-Hui Kim, Kyungki-Do, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Jul. 11, 1997, Appl. No. 893,613

Claims priority, application Rep. of Korea, Jul. 12, 1996, 96/28129

Int. Cl.[7] H03K *19/0175;19/094*

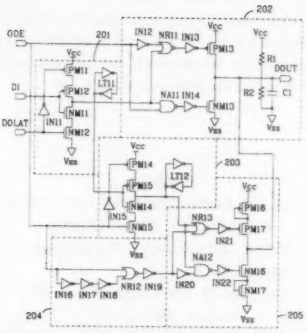
U.S. Cl. 326—87 **16 Claims**

1. An output buffer control circuit, comprising:

a first data latch means for inverting and latching an input data based on a first signal;

a data output means for logically operating an output signal from the first data latch means based on a second signal and generating an output data;

a second data latch means for inverting and latching the output signal from the first data latch unit based on the second signal;



a signal detecting means for generating a predetermined width pulse based on the second signal; and

an output terminal pre-reset unit for logically operating the predetermined width pulse outputted from the signal detecting means and an output signal from the second data latch means to pre-reset the output data of the data output means.

6,040,716

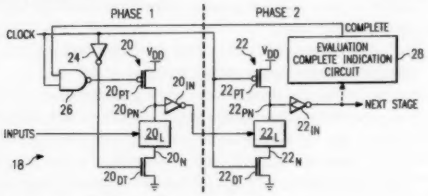
DOMINO LOGIC CIRCUITS, SYSTEMS, AND METHODS WITH PRECHARGE CONTROL BASED ON COMPLETION OF EVALUATION BY THE SUBSEQUENT DOMINO LOGIC STAGE

Patrick W. Bosshart, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/047,028, May 19, 1997. This application May 8, 1998, Appl. No. 75,056.

Int. Cl.[7] **H03K** *19/096;19/094;19/01*

U.S. Cl. 326—98 **29 Claims**



1. A domino logic circuit, comprising:

a first phase domino logic circuit;

a second phase domino logic circuit;

wherein each of the first and second phase domino logic circuits comprises:

a precharge node;

a coupling device which when conducting couples the precharge node to a precharge voltage during a precharge phase;

a discharge path connected to the precharge node which when conducting couples the precharge node to a voltage different than the precharge voltage during an evaluate phase; and

an inverter coupled to the precharge node and providing an output responsive to a voltage at the precharge node;

wherein the output of the inverter of the first phase domino logic circuit is connected to control the conduction of the discharge path of the second phase domino logic circuit;

and further comprising:

a conductor for providing a clock signal;

circuitry for commencing the evaluate phase of the first phase domino logic circuit at a first time in response to the clock signal transitioning from a first state to a second state;

circuitry for commencing the evaluate phase of the second phase domino logic circuit at a second time following the first time; and

circuitry for commencing the precharge phase of the first phase domino logic circuit at a third time following the second time;

wherein the third time corresponds to the latest of a plurality of events;

wherein a first of the plurality of events is responsive to the clock signal transitioning from the second state to the first state; and

wherein a second of the plurality of events is the discharge path of the second phase domino logic circuit having sufficient time following a beginning of the evaluate phase of the second phase domino logic circuit to conduct to cause the voltage at the precharge node of the second phase domino logic circuit to transition to a level sufficient to trigger the output of the inverter of the second phase domino logic circuit.

6,040,717

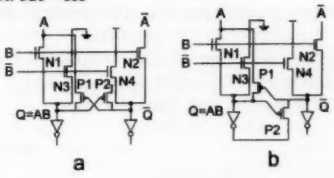
FRCPG: FORECASTED RESTORATION COMPLEMENTARY PASS GATES

Rafael Fried, Caesaria, Israel, assignor to I.C. Com Ltd., Azor, Israel

Filed Jul. 28, 1997, Appl. No. 901,834

Int. Cl.[7] **H03K** *19/094*

U.S. Cl. 326—113 **4 Claims**



AND/NAND implementation in FRCPG
a: CPL like
b: EEPL like

1. A static pass-transistor logic gate comprising

(a) pass-transistor logic circuitry, said pass-transistor logic circuitry including logic inputs, said logic inputs for receiving complementary logic input signals;

(b) an output logic-level restoration circuit, said restoration circuit including restoration-circuit inputs;

(c) each logic input which is not needed in determining the need for output logic-level restoration connected to the appropriate input logic level; and,

(d) a restoration circuit input connected to the appropriate logic-gate input to accomplish forecasting of the need for output logic-level restoration.

6,040,718

MEDIAN REFERENCE VOLTAGE SELECTION CIRCUIT

Paul M. Henry, Tucson, Ariz., assignor to National Semiconductor Corporation, Santa Clara, Calif.

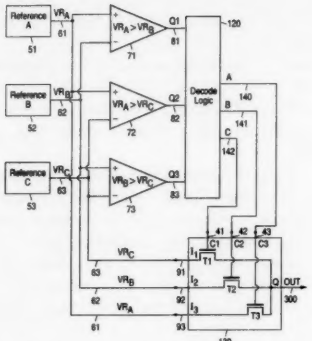
Filed Dec. 15, 1997, Appl. No. 990,561

Int. Cl.[7] **H03K** *5/22*

U.S. Cl. 327—71 **13 Claims**

1. A circuit comprising:

a comparative circuit for performing at least three compare operations, wherein in each compare operation the comparator compares two of at least three reference voltages to one another and provides a logic signal to indicate which of the two reference voltages is greater; and



a decode and select circuit for decoding the logic signals provided by the comparator circuit in the at least three compare operations and for selecting the median reference voltage from among the at least three reference voltages.

6,040,719

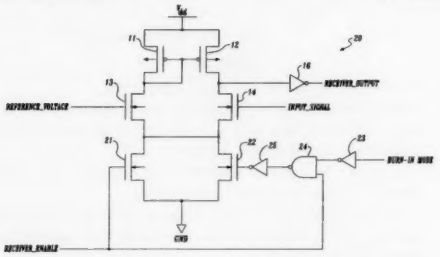
INPUT RECEIVER FOR LIMITING CURRENT DURING RELIABILITY SCREENING

Jeffrey S. Earl, San Jose, Calif., assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Mar. 17, 1998, Appl. No. 44,205

Int. Cl.[7] H03K *5/22*

U.S. Cl. 327—78 **24 Claims**



1. An input receiver that is selectively configured into a burn-in mode and a normal mode, the input receiver comprising:

a first transistor having a first terminal connected to a Vdd voltage source, a second terminal, and a third terminal connected to the second terminal;

a second transistor having a first terminal connected to the Vdd voltage source, a second terminal connected to the second and third terminals of the first transistor, and a third terminal;

a third transistor having a first terminal connected to the second and third terminals of the first transistor, a second terminal for receiving a reference_voltage signal, and a third terminal;

a fourth transistor having a first terminal connected to the third terminal of the second transistor, a second terminal for receiving an input signal, and a third terminal; and

a fifth transistor having a first terminal connected to the third terminal of the third transistor and the third terminal of the fourth transistor, a second terminal for receiving a receiver_enable signal, and a third terminal connected to a Vss voltage source;

wherein the receiver_enable signal is adjusted to a first voltage level when the input receiver is enabled during the burn-in mode and to a second voltage level when the input receiver is enabled during the normal mode, the first voltage level being different from the second voltage level.

6,040,720

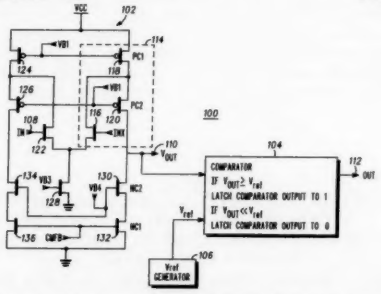
RESISTORLESS LOW-CURRENT CMOS VOLTAGE REFERENCE GENERATOR

Jeannie Han Kosiec, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 12, 1998, Appl. No. 94,534

Int. Cl.[7] H03K *5/153*

U.S. Cl. 327—83 **5 Claims**



1. A ciruit with a temperature compensated output, comprising:

an output circuit including a folded cascode output stage, the output circut producing an output voltage in response to an input voltage, the folded cascode output stage producing the output voltage with a temperature characteristic of the folded cacode output stage;

a comparator stage which compared the output voltage with a threshold voltage and produces an output signal; and

a voltage reference generator for producing the threshold voltage with the temperature characteristic of the folded cascode output stage, the voltage reference generator including

a first transistor and a second transistor series coupled between a reference potential and the comparator stage, and

a current source for biasing the first transistor and the second transistor so that the threshold voltage has the temperature characteristic of the folded cascode ourput stage.

6,040,721

DEVICE FOR TRIGGERING AN ELECTROMAGNETIC LOAD

Werner Fischer, Heimsheim, and Birte Luebbert, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 6, 1998, Appl. No. 19,629

Claims priority, application Germany, Feb. 8, 1997, 197 04 808

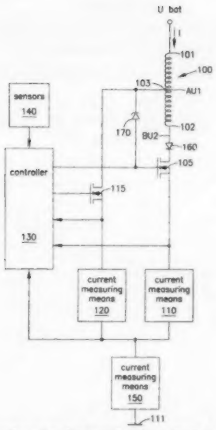
Int. Cl.[7] H03K *3/00*

U.S. Cl. 327—110 **9 Claims**

1. A device for triggering an electromagnetic load, the load being formed by at least two partial inductances, comprising:

a first switching device for selectively coupling the load to a ground;

a second switching device for selectively coupling at least one of the at least two partial inductances to the ground; and



means for triggering the first switching device as a function of a voltage measured at a point between the at least one of the at least two partial inductances and the second switching device.

6,040,722

POWER-ON RESET CIRCUIT WITH ADJUSTABLE INTERVAL

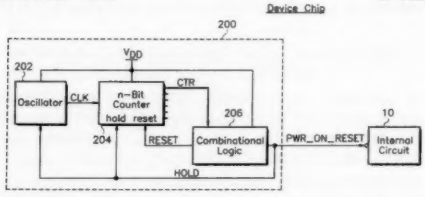
Sang-oh Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics, Co., Ltd., Suwon, Rep. of Korea

Filed May 1, 1998, Appl. No. 71,518

Claims priority, application Rep. of Korea, May 2, 1997, 97-16951

Int. Cl.[7] **H03L** *7/00*

U.S. Cl. 327—143 **15 Claims**



1. A power-on reset circuit for use with sequential logics, for generating a power-on reset signal as a power supply potential is applied, so as to allow the sequential logics to reset immediately to desired logic states, said circuit comprising:

an oscillator for generating a clock signal as the power supply potential is applied;

a counter for counting an initial data in synchronization with the clock signal to generate a counted data;

a combinational logic circuit coupled to the sequential logic, said combinational logic circuit having a power supply input coupled to the power supply potential for generating a counter reset signal used to reset the counter when the power supply potential is applied, and generating the power-on reset signal when the counted data is equal to a preset data; and

means for simultaneously disabling said oscillator and said counter,

wherein each of said oscillator and said counter includes an input for receiving the power-on reset signal, said counter also including a second input for receiving the reset signal from said combinational logic circuit and resetting said counter responsive to said reset signal.

6,040,723

INTERFACE CIRCUIT WITH HIGH SPEED DATA TRANSMISSION

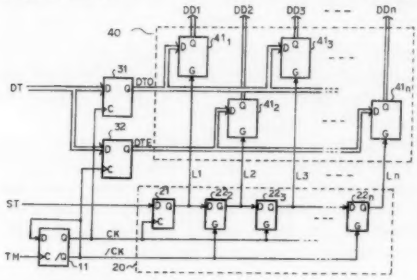
Hisatake Sato, Miyazaki, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1998, Appl. No. 114,518

Claims priority, application Japan, Jul. 17, 1997, 9-192405

Int. Cl.[7] **H04L** *7/00*

U.S. Cl. 327—144 **20 Claims**



1. An interface circuit comprising:

a clock signal generator outputting a clock signal and an inversion clock signal;

a shift signal generator receiving a start signal, the clock signal and the inversion clock signal, and outputting shift signals having odd shift signals and even shift signals, the odd shift signals including a first odd shift signal and subsequent odd shift signals, wherein the first odd shift signal is generated in response to the start signal and the clock signal, wherein the even shift signals are generated in response to a previous one of the odd shift signals and the inversion clock signal, and wherein the subsequent odd shift signals are generated in response to a previous one of the even shift signals and the clock signal;

a data distribution circuit receiving data, the clock signal and the inversion clock signal, said data distribution circuit outputting odd data in response to the data and the clock signal, and outputting even data in response to the data and the inversion clock signal;

a plurality of odd data output circuits each of which receives the odd data and outputs the received data in response to one of the odd shift signals, respectively; and

a plurality of even data output circuits each of which receives the even data and outputs the received data in response to one of the even shift signals, respectively.

6,040,724

BUS DRIVER CIRCUIT HAVING ADJUSTABLE RISE AND FALL TIMES

Hiroshi Kamiya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of application No. 08/323,776, Oct. 17, 1994, Pat. No. 5,589,789. This application Sep. 13, 1996, Appl. No. 713,840.

Claims priority, application Japan, Oct. 16, 1993, 5-281904; Oct. 26, 1993, 5-266821; Dec. 2, 1993, 5-352432

Int. Cl.[7] **H03K** *5/12*

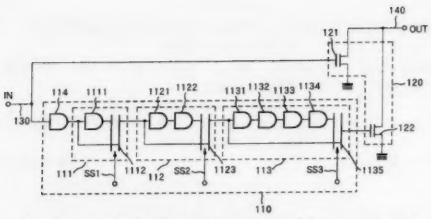
U.S. Cl. 327—170 **17 Claims**

1. A bus driver circuit for transmitting data onto a bus, comprising:

an input terminal for inputting an input signal;

a delay circuit for outputting a delayed signal based on said input signal, said delay circuit generating said delayed signal by receiving at least one selection signal which causes said delay circuit to delay said input signal for one of a plurality of preset delay periods;

an output circuit for forming an output signal by superimposing the input signal from said input terminal onto said delayed



signal from said delay circuit, so that said output signal has a rise time and fall time which defines a waveform shape; and

an output terminal for outputting the output signal from said output circuit to said bus,

wherein said one of said plurality of preset delay periods used to generate said delayed signal is selected by said at least one selection signal so that said waveform shape causes said driver circuit to achieve a through rate which is faster than a through rate achieved by selection of any of remaining ones of said plurality of preset delay periods.

6,040,725

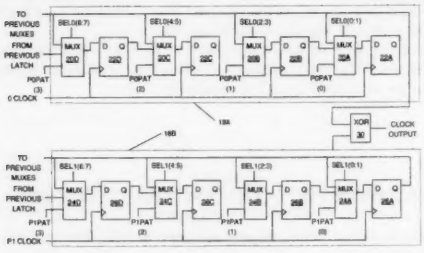
DYNAMICALLY CONFIGURABLE VARIABLE FREQUENCY AND DUTY CYCLE CLOCK AND SIGNAL GENERATION

William Robert Lee, and Leland Duane Richardson, both of Apex, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1998, Appl. No. 89,757

Int. Cl.[7] H03K *1/04*

U.S. Cl. 327—175 **24 Claims**



1. A variable clock generator comprising:

a clock multiplier that is responsive to a reference clock and which generates at least two clock signals which are out of phase with each other; and

a clock divider which is responsive to at least one divider pattern and which is operably associated with the clock multiplier for receiving the at least two clock signals from the clock multipler to generate an output clock based on the divider patterns and the clock signals;

wherein the clock divider comprises:

a plurality of loadable linear feedback shift registers each having an output; and

an EXCLUSIVE OR gate that is responsive to the outputs of the linear feedback shift registers to produce the output clock.

6,040,726

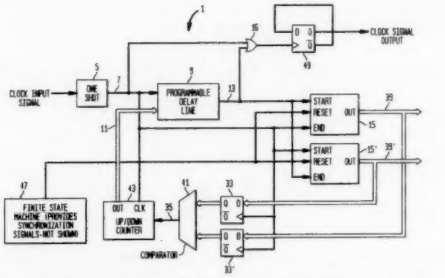
DIGITAL DUTY CYCLE CORRECTION LOOP APPARATUS AND METHOD

David G. Martin, Bethlehem, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 14, 1998, Appl. No. 152,656

Int. Cl.[7] H03K *3/017*

U.S. Cl. 327—175 **15 Claims**



1. An apparatus for providing a clock signal having a fifty-percent duty cycle, comprising:

a signal input having a plurality of pulses;

a programmable delay line coupled to said signal input and producing a delayed output signal having a plurality of delayed pulses, each of said plurality of delayed pulses being delayed relative to one of said plurality of pulses, said programmable delay line having a plurality of delay selection lines for adjusting the delay between said each of said plurality of pulses and a corresponding delayed pulse of said plurality of delayed pulses;

a first thermometer code generator, said delayed output signal and said signal input being coupled to said first thermometer code generator, said first thermometer code generator generating a first thermometer code output representing the delay between one of said plurality of delayed pulses and a next of said plurality of pulses;

a second thermometer code generator, said signal input and said delayed output signal being coupled to said second thermometer code generator, said second thermometer code generator generating a second thermometer code output representing the delay between one of said plurality of pulses and the corresponding delayed pulse of said plurality of delayed pulses;

a comparator circuit, said first thermometer code output and said second thermometer code output being coupled to said comparator circuit, said comparator circuit comparing said first thermometer code output to said second thermometer code output and generating an output based on the comparison;

a counter circuit receiving said output of said comparator circuit, said counter having an output coupled to said delay selection lines, so that if said first thermometer code output is greater than said second thermometer code output, then said counter output increments said delay selection lines thereby increasing the delay between said plurality of pulses and said plurality of delayed pulses, and if said first thermometer code output is less than said second thermometer code output, then said counter output decrements said delay selection lines thereby decreasing the delay between said plurality of pulses and said plurality of delayed pulses;

an or-gate, said or-gate receiving said signal input and said delayed output signal, and generating an output; and

an edge triggered toggle circuit, said toggle circuit receiving said output of said or-gate and generating an output, so that when said first thermometer code output equals said second thermometer code output, said output of said toggle circuit has a fifty-percent duty cycle.

6,040,727
DELAY DEVICE

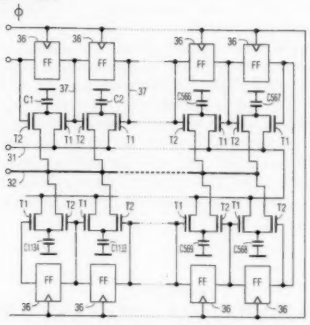
Sönke Struck, Ney Wulmstorf, and Ernst Holger, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1998, Appl. No. 61,814

Claims priority, application Germany, May 2, 1997, 197 18 617

Int. Cl.[7] H03H *11/26*

U.S. Cl. 327—277 **5 Claims**



1. A delay device comprising storage elements arranged in at least two rows in an integrated circuit, characterized in that the delay device comprises an even number of storage elements, and a clock generation circuit for receiving a first clock signal for producing a delay time equal to an odd multiple of a clock period of the first clock signal, said clock generation circuit generating a second clock signal for clocking the storage elements said second clock signal being generated from the first clock signal in such a manner that one clock pulse of the first clock signal is suppressed in a selectable or given cycle and all the other clock pulses in the cycle are taken over in the second clock signal.

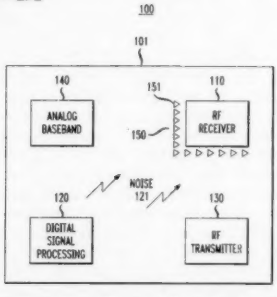
6,040,728
ACTIVE SUBSTRATE NOISE INJECTION CANCELLATION

Dale H. Nelson, Shillington, and Iconomos A. Koullias, Reading, both of Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed May 29, 1998, Appl. No. 86,842

Int. Cl.[7] H03K *5/00*

U.S. Cl. 327—292 **12 Claims**



1. In an integrated circuit formed within a substrate, an array of noise cancellation circuits located at a first location of the substrate for blocking noise generated within the substrate from a noise source located at a second location, wherein each noise cancellation circuit comprises:

(a) a first input terminal coupled to a reference ground;

(b) a second input terminal coupled to the substrate and an output terminal coupled to the substrate, wherein the noise cancellation circuit injects current into the substrate so as to prevent a substrate potential at the first location from changing.

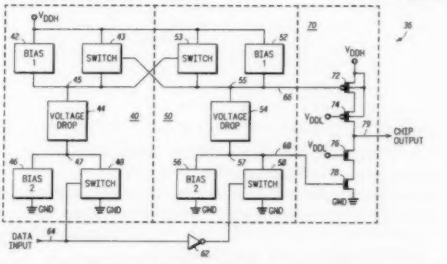
6,040,729
DIGITAL OUTPUT BUFFER FOR MULTIPLE VOLTAGE SYSTEM

Hector Sanchez, Cedar Park; Jose M. Alvarez, Leander; Joshua Siegel, and Carmine Nicoletta, both of Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 25, 1997, Appl. No. 917,306

Int. Cl.[7] H03K *17/687*

U.S. Cl. 327—309 **22 Claims**



1. A digital output buffer for a multiple voltage system, comprising:

a first voltage limiting logic circuit having a first power supply terminal for receiving a first voltage, a second power supply terminal for receiving a second voltage, an input terminal for receiving a digital input signal, a first output terminal for providing a first predrive signal, and a second output terminal for providing a second predrive signal;

said digital input signal characterized as having logic levels corresponding to said second voltage and a third voltage;

said first predrive signal having logic levels corresponding to either said first voltage or a first intermediate voltage;

said second predrive signal having logic levels corresponding to either a second intermediate voltage or said second voltage;

a first transistor having a first current electrode for receiving said first voltage, a control electrode for receiving said first predrive signal, and a second current electrode coupled to an output terminal of the digital output buffer; and

a second transistor having a first current electrode coupled to said output terminal of the digital output buffer, a control electrode for receiving said second predrive signal, and a second current electrode for receiving said second voltage,

a difference between said first voltage and said first intermediate voltage being less than a dielectric breakdown voltage of said first transistor,

said first voltage limiting logic circuit comprising:

a first bias element having a first terminal for receiving said first voltage, and a second terminal for providing said first predrive signal;

a voltage dropping element having a first terminal coupled to said second terminal of said first bias element, and a second terminal for providing said second predrive signal; and

switching means coupled between said second output terminal of said first voltage limiting logic circuit and said second power supply terminal for providing either said first voltage or said first intermediate voltage to said first output terminal of said first voltage limiting logic circuit in response to said digital input signal.

6,040,730

INTEGRATED CAPACITANCE MULTIPLIER ESPECIALLY FOR A TEMPERATURE COMPENSATED CIRCUIT

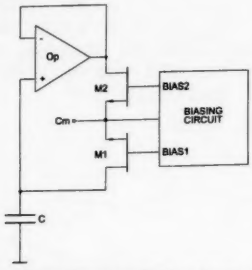
Bruno Ferrario, Fino Mornasco, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jul. 28, 1993, Appl. No. 98,740

Claims priority, application European Pat. Off., Jul. 28, 1992, 92830419

Int. Cl.[7] G06G *7/64;* **H03B** *1/00*

U.S. Cl. 327—344 **22 Claims**



1. An integrated capacitance multiplier circuit, comprising:

an integrated circuit capacitor;

first and second field-effect transistors, integrated on a common substrate with said capacitor; said first transistor having a width-to-length ratio which is more than ten times the width-to-length ratio of said second transistor;

a biasing circuit connected to bias said first and second transistors, into an ohmic regime of operation, with first and second respective gate voltages which have different temperature dependences;

an operational amplifier configured and operatively connected to follow the potential of a first terminal of said capacitor, and to drive a first source/drain terminal of said second transistor with a corresponding voltage;

said second transistor having a second source/drain terminal which is connected to a capacitance node;

said first transistor being connected in series between said capacitance node and said first terminal of said capacitor;

whereby said capacitance node sees an effective capacitance which is much greater than the capacitance of said capacitor.

6,040,731

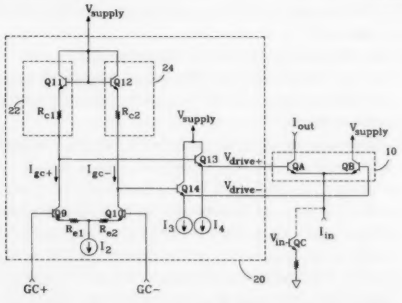
DIFFERENTIAL PAIR GAIN CONTROL STAGE

Ricky Y. Chen, Irvine; Lloyd F. Linder, Agoura Hills; Don C. Devendorf, Carlsbad, and Matthew S. Gorder, Riverside, all of Calif., assignors to Raytheon Company, El Segundo, Calif.

Filed May 1, 1997, Appl. No. 848,930

Int. Cl.[7] G06F *7/44;* **H03L** *5/00*

U.S. Cl. 327—359 **16 Claims**



1. A differential pair gain control stage with offset, comprising:

a first differential pair comprising first and second transistors having respective control inputs and respective current circuits controlled by said control inputs with said current circuits connected at a common junction, said common junction forming a current input, said first transistor's current circuit providing a current output and said second transistor's current circuit connected to a line that is adapted to receive a fixed supply voltage, and

a drive circuit comprising a second differential transistor pair having respective control inputs and respective current circuits controlled by said control inputs, said control inputs connected to receive a differential input signal, said current circuits connected to a supply voltage line through respective loads to produce respective drive signals which vary with said differential input signal and are connected to said control inputs of said first differential pair to control the flow of current between said current input and said current output,

said loads arranged to introduce an offset into the transfer function between said differential input signal and said drive signals that increases the range over which said first transistor conducts current for a symmetrical differential input signal.

6,040,732

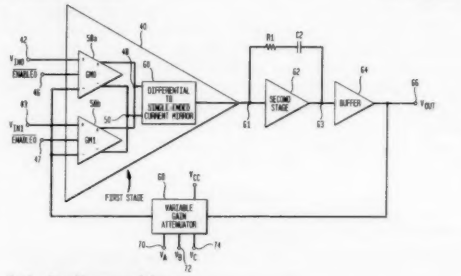
SWITCHED-TRANSCONDUCTANCE CIRCUIT WITHIN INTEGRATED T-SWITCHES

A. Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Apr. 9, 1997, Appl. No. 833,715

Int. Cl.[7] H03K *19/094;17/16*

U.S. Cl. 327—408 **16 Claims**



1. A circuit, comprising:

a first transconductance stage including:

a transconductance element that receives a first control signal to enable the transconductance element and a first input voltage and, when enabled, provides a first output current to at least one output node of the transconductance element, the first output current having an amplitude that is proportional to an amplitude of the first input voltage;

at least one first switch coupled between the at least one output node of the transconductance element and an output node of the first transconductance stage such that activation of the at least one first switch causes the at least one output node of the transconductance element to be coupled to the output node of the first transconductance stage; and

at least one second switch coupled between the at least one output node of the transconductance element and a constant voltage node, the at least one second switch being activated such that, regardless of a state of the at least one first switch, the at least one output node of the transconductance element is coupled to the constant voltage node;

a second transconductance stage that receives a second input voltage and provides a second output current having an amplitude that is proportional to an amplitude of the second input voltage; and

at least one additional circuit stage that receives the first and second output currents and, responsive thereto, provides an output signal at a signal output node that is proportional to a combination of the first and second output currents.

6,040,733

TWO-STAGE FUSIBLE ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT

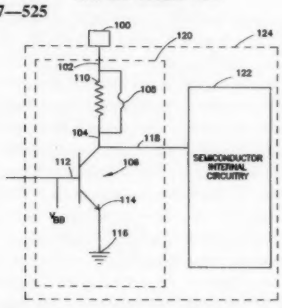
Stephen L. Casper, and Manny Ma, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/859,693, May 21, 1997, Pat. No. 5,805,009. This application Jul. 17, 1998, Appl. No. 118,543.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H02H *7/20*

U.S. Cl. 327—525 **12 Claims**



1. A electrostatic discharge protection circuit operatively coupled between a bonding pad of a semiconductor device and internal circuitry of the semiconductor device, the protection circuit comprising:

first means, operatively coupled to the bonding pad and the internal circuitry, for providing a first discharge path having a relatively low resistance when a voltage on the bonding pad exceeds a threshold voltage value;

wherein the resistance of the first discharge path substantially increases when a voltage on the bonding pad exceeds a prescribed voltage value and wherein the prescribed voltage value is greater than the threshold voltage value; and

a second means, operatively coupled to the bonding pad and the internal circuitry, for providing a second discharge path when a voltage on the bonding pad exceeds the threshold voltage value and after the resistance of the first discharge path has been substantially increased.

6,040,734

SUPPLY VOLTAGES SWITCH CIRCUIT

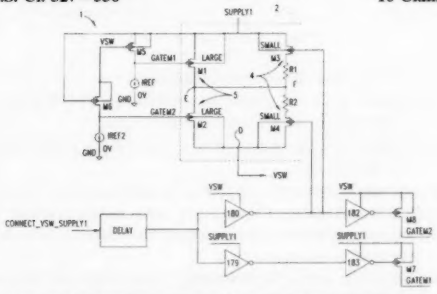
Corrado Villa; Luigi Bettini, both of Milan, and Simone Bartoli, Pisa, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Continuation of application No. 08/775,109, Dec. 30, 1996, abandoned. This application Jul. 2, 1998, Appl. No. 109,630.

Claims priority, application European Pat. Off., Dec. 29, 1995, 95830556; Jun. 20, 1996, 96830353

Int. Cl.[7] H02J *3/38*

U.S. Cl. 327—530 **10 Claims**



1. In an electrically programmable non-volatile memory device, a circuit having a ground voltage reference and a plurality of branch circuits for switching between a plurality of voltage supplies other than the ground voltage reference, each branch circuit being coupled between a respective one of the voltage supplies and a terminal coupled to an element in the memory device to receive one of the voltage supplies other than the ground voltage reference, at least one of the branch circuits comprising:

a bridge circuit coupled between one of the voltage supplies and the terminal coupled to the element in the memory device, the bridge circuit comprising a first pair of first and second transistors coupled in series between the voltage supply and the terminal and a second pair of third and fourth transistors coupled in series between the voltage supply and the terminal, wherein the third and fourth transistors comprise transistors of a P-channel type; and

a pair of resistors coupled in series between the third and fourth transistors of the second pair of transistors.

6,040,735

REFERENCE VOLTAGE GENERATORS INCLUDING FIRST AND SECOND TRANSISTORS OF SAME CONDUCTIVITY TYPE

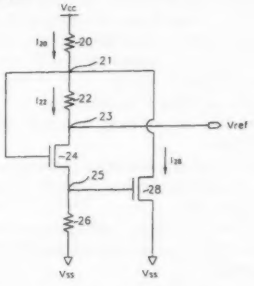
Jong-min Park, Kyunggi-do, and Tae-sung Jung, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Sep. 12, 1997, Appl. No. 927,606

Claims priority, application Rep. of Korea, Sep. 13, 1996, 96-39902

Int. Cl.[7] G05F *1/10*

U.S. Cl. 327—541 **8 Claims**



1. A reference voltage generator that generates a reference voltage at a reference voltage output terminal thereof, the reference voltage generator comprising:

first and second transistors of same conductivity type, each having a controlling electrode and a pair of controlled electrodes; and

first and second nodes, a respective one of which is connected to respective first and second power supply voltages;

the controlled electrodes of the first transistor being connected between the reference voltage output terminal and the second node;

the controlled electrodes of the second transistor being connected between the first node and the second power supply voltage;

the controlling electrode of the first transistor being connected to the first node; and

the controlling electrode of the second transistor being connected to the second node;

wherein the first and second transistors include complementary temperature characteristics.

6,040,736

CONTROL CIRCUIT FOR POWER TRANSISTORS IN A VOLTAGE REGULATOR

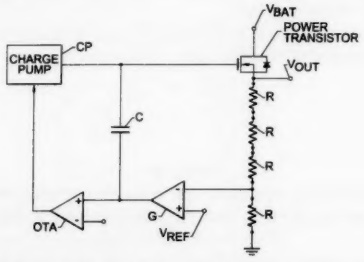
Andrea Milanesi, Casalnoceto; Vanni Poletto, Casale Monferrato; Alberto Poma, Pavia, and Marco Morelli, Leghorn, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Arate Brianza, Italy, and Magneti Marelli S.p.A., Milan, Italy

Filed Dec. 4, 1997, Appl. No. 984,959

Claims priority, application European Pat. Off., Dec. 5, 1996, 96830610

Int. Cl.[7] **G05F** *1/10*

U.S. Cl. 327—541 **14 Claims**



1. A voltage-regulator circuit comprising:

a power transistor which is supplied with an input voltage for regulating an output voltage;

a voltage-raising circuit which is supplied with the input voltage for driving a control terminal of said power transistor;

a closed feedback control circuit cooperating with said power transistor and said voltage-raising circuit for defining a first feedback loop having high gain and low response speed, and a second feedback loop having low gain, wide passband, and quick response speed, said feedback control circuit operating based on a difference between a signal indicative of the output voltage and a reference voltage;

wherein said first feedback loop comprises:

a resistive divider for providing the signal indicative of the output voltage;

a first amplifier having a first input connected to said resistive divider, a second input connected to the reference voltage, and an output; and

a second amplifier having an input connected to the output of said first amplifier and an output connected to said voltage-raising circuit.

6,040,737

OUTPUT BUFFER CIRCUIT AND METHOD THAT COMPENSATE FOR OPERATING CONDITIONS AND MANUFACTURING PROCESSES

Nalini Ranjan, Sunnyvale, and Henry Yang, San Jose, both of Calif., assignors to S3 Incorporated, Santa Clara, Calif.

Filed Jan. 9, 1998, Appl. No. 5,077

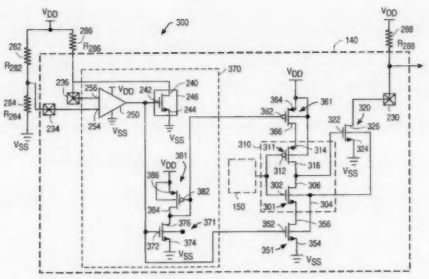
Int. Cl.[7] **G05F** *1/10*

U.S. Cl. 327—543 **16 Claims**

1. A circuit for compensating an integrated circuit chip to account for variations in process and operating conditions, the circuit comprising:

a resistor having a first end coupled to a first voltage, and having a second end for supplying a control voltage;

a transistor having a first port coupled to the second end of the resistor, a second port coupled to a second voltage, and a third port for controlling the amplitude of a current flowing between the first and second ports;



an operational amplifier having a first input coupled to the second end of the resistor for receiving the control voltage, a second input coupled to a reference voltage between the first and second voltages, and an output coupled to the third port of the transistor for providing a compensation voltage thereto, with the compensation voltage maintaining said current in the transistor at a substantially constant amplitude;

a second transistor having a fourth port coupled to the output of the operational amplifier for receiving the compensation voltage, a fifth port coupled to the second voltage, and a sixth port for supplying a flow of current at an amplitude responsive to the compensation voltage; and

circuitry having an effective resistance, the circuitry providing a third end and a fourth end, the third end coupled to the sixth port of the second transistor for receiving the flow of current, the fourth end coupled to the first voltage for supplying said flow of current thereto, with the voltage drop across the circuitry providing a second compensation voltage at the third end of the circuitry.

6,040,738

DIRECT CONVERSION RECEIVER USING SINGLE REFERENCE CLOCK SIGNAL

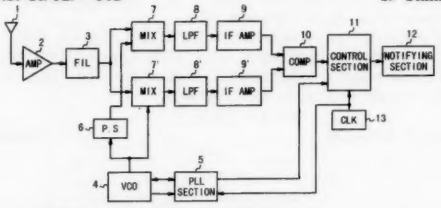
Jun Uchida, Shizuoka, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1998, Appl. No. 201,176

Claims priority, application Japan, Dec. 10, 1997, 9-339550

Int. Cl.[7] **H04Q** *7/14;7/18;* **H03D** *3/00;* **H04L** *27/14;27/152*

U.S. Cl. 329—302 **19 Claims**



1. A direct conversion receiver comprising:

an amplifier section for amplifying a received signal and extracting a desired signal from the amplified signal;

a reference clock signal generating section for generating reference clock signal;

an extraction reference clock signal generating section for frequency-dividing said reference clock signal based on a frequency division data to generate first and second extraction reference clock signals;

an extracting section for extracting a data from said desired signal and said first and second extraction reference clock signals; and

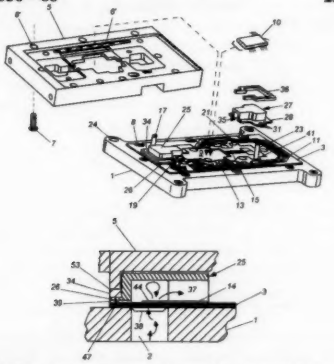
a control and processing section for outputting said frequency division data to said extraction reference clock signal generating section and for processing said data based on a control section clock signal corresponding to said reference clock signal.

6,040,739

WAVEGUIDE TO MICROSTRIP BACKSHORT WITH EXTERNAL SPRING COMPRESSION

Robert S. Wedeen, Manhattan Beach; Arthur J. Durham, Torrance; Matthew D. Ferris, Redondo Beach, and G. Sam Dow, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 2, 1998, Appl. No. 145,917
Int. Cl.[7] H03F *1/00;* H01P *5/107*
U.S. Cl. 330—66 **23 Claims**



6. A MMW microwave amplifier module, comprising:

a base plate;

a cover plate for attachment to said base plate in covering relationship therewith;

said base plate including at least a first passage there through defining a waveguide for propagation of microwave energy;

a printed wiring board comprising a dielectric material, said printed wiring board being bonded to said base plate and covering an end of said waveguide;

a backshort member, said backshort member including an internal cavity defining a short circuited waveguide transmission line of a predetermined length, and said short-circuited waveguide transmission line having an open end;

said backshort member being positioned atop said printed wiring board and overlying an end of said waveguide with said open end of said short-circuited waveguide transmission line overlying and aligned with said end of said waveguide;

said printed wiring board including at least a probe and a microstrip transmission line, and said microstrip transmission line being coupled to said probe to couple microwave energy there between;

said microstrip transmission line extending under and through said backshort member;

said probe being located within said open end of said short-circuited waveguide transmission line overlying said end of said waveguide to couple microwave energy between said waveguide and said microstrip transmission line;

a spring member associated with said metal backshort member, said spring member being positioned between said metal cover plate and the exterior surface of said metal backshort member;

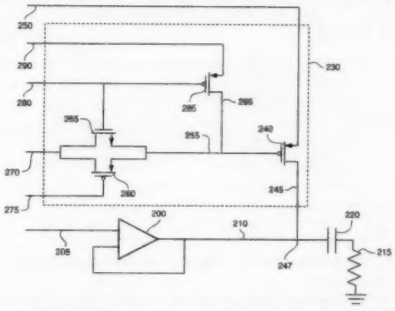
said metal cover plate for compressing said spring member against said printed wiring board when said cover plate is attached to said metal base plate, whereby said backshort is held in position pressed against said printed wiring board.

6,040,740

AUDIO TRANSIENT SUPPRESSION DEVICE

Charles Stephen Dondale, Fort Collins, Colo., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 9, 1997, Appl. No. 833,816
Int. Cl.[7] H03F *1/26*
U.S. Cl. 330—149 **8 Claims**



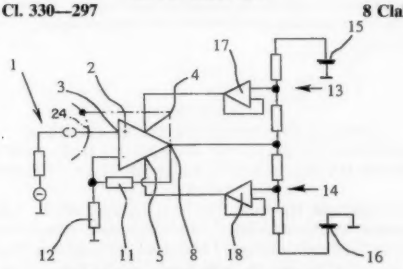
1. A method of suppressing an audible transient generated from an amplifier comprising the step of biasing an output node coupled to the amplifier to approximately a voltage corresponding to a common mode voltage of an audio signal input to the amplifier.

6,040,741

PREAMPLIFIER FOR AMPLIFYING SIGNAL VOLTAGES FROM A SIGNAL SOURCE WITH HIGH SOURCE IMPEDANCE

Roland Van der Pol, Venlo, Netherlands, assignor to Krohne Messtechnik GmbH & Co. KG, Germany

Filed Jun. 4, 1997, Appl. No. 868,849
Int. Cl.[7] H03F *3/04*
U.S. Cl. 330—297 **8 Claims**

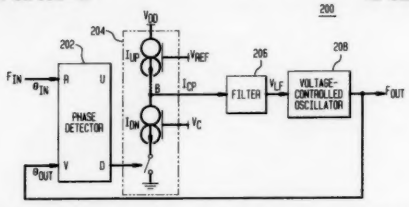


1. A preamplifier for amplifying signal voltages from a signal source (**1**) having high source impedance, with an operational amplifier (**2**), which operational amplifier (**2**) is provided with a signal input (**3**), a first supply voltage terminal (**4**) for a first supply-voltage potential, a second supply voltage terminal (**5**) for a second supply-voltage potential, and a signal output (**8**), the said signal output (**8**) delivering an output signal and the said first supply-voltage potential and the second supply-voltage potential permitting parallel shifting as a function of the output signal, wherein the signal output (**8**) can be connected via a first voltage divider (**13**) having a center pick-off tap to a first supply voltage source (**15**) and via a second voltage divider (**14**) having a center pick-off tap to a second supply voltage source (**16**) and the center pick-off tap of the first voltage divider (**13**) is connected via a first voltage follower (**17**) to the first supply voltage terminal (**4**) of the operational amplifier (**2**) and the center pick-off tap of the second voltage divider (**14**) is connected via a second voltage follower (**18**) to the second supply voltage terminal (**5**) of the operational amplifier (**2**) characterized in that the potential on a shielding (**24**) of the signal source (**1**) is controllable by the output signal.

6,040,742
CHARGE-PUMP PHASE-LOCKED LOOP WITH DC CURRENT SOURCE

James A. Bailey, Snowflake, Ariz., and William B. Wilson, Macungie, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Provisional application No. 60/057,875, Sep. 2, 1997. This application Sep. 1, 1998, Appl. No. 144,913.
Int. Cl.[7] H03L *7/07;7/089;7/093*
U.S. Cl. 331—2 **12 Claims**



1. An integrated circuit having a phase-locked loop (PLL), the PLL comprising:

(a) a first phase detector, configured to receive an input signal and a feedback signal and to generate DOWN pulses based on differences in phase between the input and feedback signals;

(b) a first charge pump, configured to receive the DOWN pulses from the first phase detector and comprising:

(1) a first UP current source configured to generate a first DC UP current; and

(2) a first DOWN current source, configured to generate a first DOWN current based on the DOWN pulses from the first phase detector, wherein the first charge pump generates a first charge-pump current based on the first DC UP current and the first DOWN current;

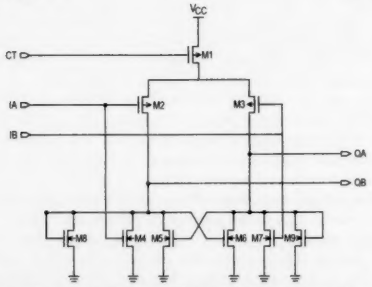
(c) a loop filter, configured to receive the first charge-pump current and to generate a loop-filter voltage based on a net accumulation of charge from the first charge-pump current; and

(d) a voltage-controlled oscillator, configured to receive the loop-filter voltage and to generate an output signal whose frequency is based on the loop-filter voltage, wherein the feedback signal is generated from the output signal.

6,040,743
VOLTAGE CONTROLLED OSCILLATOR FOR RECOVERING DATA PULSES FROM A DATA INPUT STREAM HAVING DIGITAL DATA WITH AN UNKNOWN PHASE

Anders Björklid, Hässelby; Malcolm Hardie, Järfälla, both of Sweden, and Heinz Mäder, Weinfelden, Switzerland, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 14, 1998, Appl. No. 114,846
Claims priority, application Sweden, Jul. 14, 1997, 9702691
Int. Cl.[7] H03B *5/24;* **H03L** *7/099;* **H03F** *3/45*
U.S. Cl. 331—57 **6 Claims**



1. A voltage controlled oscillator (VCO) for use in a phase locked loop for clock multiplication, which can be used to recover data pulses from a data input stream comprising digital data with an unknown phase, comprising:

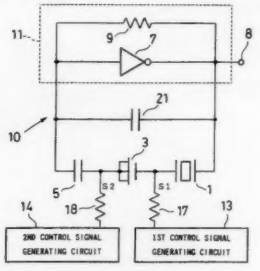
a plurality of VCO stages, each of said stages being implemented as a differential amplifier;

the amplifier load being formed of two cross-coupled gate devices and two gate devices which are connected as diodes, wherein a differential input is applied to a source coupled pair of gate devices as well as to two pull-down gate devices.

6,040,744
TEMPERATURE-COMPENSATED CRYSTAL OSCILLATOR

Yasuhiro Sakurai, and Hiroyuki Fukayama, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1998, Appl. No. 111,800
Claims priority, application Japan, Jul. 10, 1997, 9-185309
Int. Cl.[7] H03L *1/02*
U.S. Cl. 331—176 **18 Claims**



1. A temperature-compensated crystal oscillator, comprising:

a crystal oscillation circuit provided with an AT-cut crystal resonator and an MOS capacitor for providing a variable capacitance for adjustment of an oscillation frequency;

a first control signal generating circuit for temperature compensation, connected directly or via a first input resistor to one terminal of the MOS capacitor; and

a second control signal generating circuit for temperature compensation, connected directly or via a second input resistor to another terminal of the MOS capacitor,

wherein the crystal oscillation circuit further comprises:

a series connection of the AT-cut crystal resonator, the MOS capacitor, and a first fixed capacitor, in that order;

an amplifier connected in parallel with series connection; and

a second fixed capacitor coupled in parallel with the amplifier.

6,040,745
UNBALANCED-TO-BALANCED CONVERTER

Hiroaki Tanaka, Mishima-gun; Yutaka Sasaki, Nagaokakyo, and Takuya Hashimoto, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

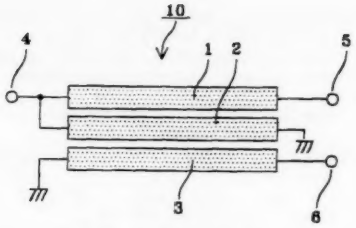
Filed Nov. 25, 1997, Appl. No. 978,402
Claims priority, application Japan, Nov. 26, 1996, 8-315215
Int. Cl.[7] H03H *7/42*
U.S. Cl. 333—26 **6 Claims**

1. An unbalanced-to-balanced converter for use at a given wavelength, comprising:

first, second, and third distributed-constant lines disposed in this order and arranged for being electromagnetically coupled with each other;

said first, second, and third distributed-constant lines having coupling sections whose length is substantially one fourth of said given wavelength; and

a first end of said first distributed-constant line is an input terminal, said first end of said first distributed-constant line is connected to a first end of said second distributed-constant



line, a second end of said second distributed-constant line and a first end of said third distributed-constant line are grounded, a second end of said first distributed-constant line is a first output terminal, and a second end of said third distributed-constant line is a second output terminal,

wherein said first, second and third distributed-constant lines are disposed so that in response to an input signal received at said input terminal, a pair of output signals appear at said first and second output terminals having phases substantially 180° apart and having substantially the same level, and

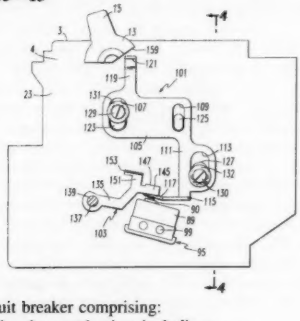
wherein said first, second and third distributed-constant lines are at least 10 μm apart.

6,040,746

ACTUATION MECHANISM FOR TRIP ACTUATED BREAKER AUXILIARY MULTIPLE MICROSWITCH

James G. Maloney, Industry, and Ronald D. Smiddle, Canonsburg, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 30, 1998, Appl. No. 223,203
Int. Cl.[7] H01H *75/02;3/20;9/02*
U.S. Cl. 335—13 **9 Claims**



1. A circuit breaker comprising:

a circuit breaker mechanism including:

a fixed contact;

a contact arm;

a movable contact secured to one end of said contact arm and movable by said contact arm toward and way from said fixed contact to close and open said contacts:

a pivotally mounted operating member engaging another end of said contact arm for moving, and for movement by, said contact arm between off/open and on/closed positions of said operating member and said contacts respectively, said operating member having an integral handle and a cam surface;

a pivotally mounted latchable cradle;

a spring connecting said latchable cradle and said contact arm; and

a trip device latching said cradle in a latched position and unlatching said cradle in response to preset current conditions, said cradle tripping said contact arm to open said contacts and move said operating member to a tripped position when unlatched;

a first microswitch having a plunger;

a second microswitch having a plunger;

said first and second microswitches positioned adjacent one another;

actuating means including a first actuating member and a second actuating member,

said first actuating member bearing against said cam surface on said operating member, said cam surface actuating said first and second microswitches through said first actuating member when said operating member and said integral handle are in the off position;

said second actuating member engaging said cradle and actuating said first and second microswitches through said first actuating member when said cradle is unlatched, said first and second actuating members being cascaded to operate said plunger of said first microswitch and said plunger of said second microswitch; and

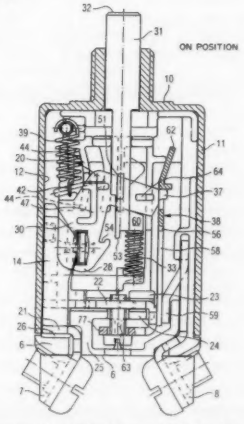
a housing with first and second compartments separated by a partition, wherein said contacts, said contact arm, said spring, said cradle, and said trip device are mounted in said first compartment, and said first and second microswitches are mounted in said second compartment, wherein said operating member extends into both compartments with said cam surface located in said second compartment, said partition having an opening through which said second actuating member extends to engage said cradle and wherein said first actuating member is mounted in said second compartment to engage said camming surface and actuate said first and second microswitches.

6,040,747

OVERCURRENT CIRCUIT BREAKER

Fritz Krasser, and Franz Winkler, both of Altdorf, Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Germany

Filed Sep. 8, 1997, Appl. No. 925,045
Claims priority, application Germany, Sep. 7, 1996, 296 15 644; Sep. 10, 1996, 296 15 761; Nov. 19, 1996, 196 47 716
Int. Cl.[7] H01H *75/12*
U.S. Cl. 335—35 **27 Claims**



1. An overcurrent circuit breaker switch having a flat, approximately block shaped housing made of insulating material with first and second front walls and side walls that extend approximately parallel to each other, and a switch gear located between the parallel side walls and having a movement plane in which components of the switch gear move that extends approximately parallel to the side walls of the housing, the first front wall having a bushing for contact connections and the second front wall having a bushing for a device for manual actuation of the switch gear, said switch comprising:

a contact bridge support made of insulating material, said contact bridge support being a component of the switch gear;

two fixed contacts, each having a narrow edge and a flat piece with a longitudinal axis which extends away from said first front wall into an interior of the housing, said two fixed contacts being spaced from one another and being positioned so that said contact bridge support projects into the space between said two fixed contacts; and

a contact bridge movable between an on position and an off position, said contact bridge being held inside the contact bridge support and having a longitudinal axis that extends in a bridging direction which aligns approximately at a right angle to the movement plane for the switch gear, said contact bridge having contact ends that project on both sides over said contact bridge support in the direction of the side walls of the housing,

wherein said fixed contacts are flat pieces that are aligned in the manner of a knife blade, are each positioned with a flat side approximately parallel to the side walls, and form respectively one contact point with a side of the narrow edge facing said contact bridge, the contact points being parallel to one another, the other side of the narrow edge of the fixed contacts facing and fitting flush against a flank wall of the housing.

6,040,748

MAGNETIC MICROSWITCH

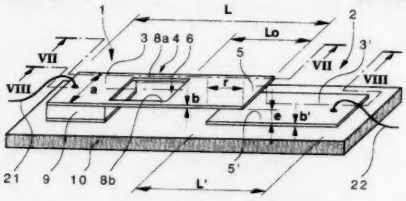
François Gueissaz, Marin, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Apr. 10, 1998, Appl. No. 58,303

Claims priority, application Switzerland, Apr. 21, 1997, 0919/97

Int. Cl.[7] H01H *51/22*

U.S. Cl. 335—78 **16 Claims**



1. A magnetic microswitch, made in one piece by galvanic growth from a substrate, including two conductive strips having, with respect to one another, overlapping ends and remote ends, connected at their remote ends to electric connection means, and each including a distal portion, whose overlap determines an air gap of distance e,

at least one of said strips being made of magnetic material and consisting of one remote end attached to the substrate via a foot, a distal portion, and a median portion formed by at least one isthmus connecting said distal portion to the end fixed to the foot, said strip having a constant thickness and being flexible with respect to the distal portion of the second strip between an open position in the absence of a magnetic field and a closed position in which the two strips are in contact with each other under the influence of the magnetic field,

wherein said median portion of the flexible strip is formed with a total cross-section less than the cross-section of the distal portion, thereby allowing the strip to have both deflection of an amplitude at least equal to e to make contact under the influence of a magnetic field and sufficient return force towards the open position in the absence of a magnetic field.

6,040,749

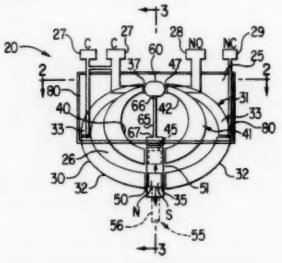
APPARATUS AND METHOD FOR OPERATING A MICROMECHANICAL SWITCH

Daniel W. Youngner, Maple Grove, and Jeffrey A. Ridley, Burnsville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1998, Appl. No. 223,559

Int. Cl.[7] H01H *51/22*

U.S. Cl. 335—78 **21 Claims**



1. A micromechanical switch operating between a closed position and an open position, the micromechanical switch comprising:

a first electrically and magnetically conductive layer forming a first closure path having a first primary opening for accepting a magnet therein and a first secondary opening providing an electrical opening between a first set of contacts of the switch, a second electrically and magnetically conductive layer forming a second closure path having a second primary opening for accepting a magnet therein and a second secondary opening providing an electrical opening between a second set of contacts of the switch, the first closure path conductively isolated from the second closure path;

a magnet movably mounted with respect to the first closure path and the second closure path, the magnet movable between a magnet first position within the first primary opening and a magnet second position within the second primary opening;

an actuator selectively moving the magnet between the magnet first position and the magnet second position; and

an electrical contact element separate from the magnet and movably mounted with respect to the first closure path and the second closure path, the electrical contact element movable between an element first position where the contact element electrically shorts the first conductive layer across the first secondary opening and an element second position where the electrical contact element electrically shorts the second conductive layer across the second secondary opening;

whereby the first and second closure paths for magnetic shunt paths for directing magnetic flux from the magnet through a selected primary opening to a respective secondary opening, the flux in the secondary opening thereby drawing the electrical contact to close the secondary opening.

6,040,750

ELECTROMAGNETIC SWITCHING DEVICE

Hans Pfab, Hahnbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE97/02603, § 371 Date May 20, 1999, § 102(e) Date May 20, 1999, PCT Pub. No. WO98/22966, PCT Pub. Date May 28, 1998

PCT Filed Nov. 7, 1997, Appl. No. 308,546

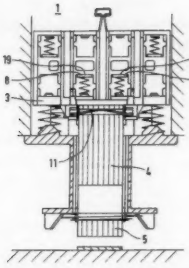
Claims priority, application Germany, Nov. 20, 1996, 196 48 053

Int. Cl.[7] H01H *7/16*

U.S. Cl. 335—156 **2 Claims**

1. An electromagnetic switching device, comprising:

movable contact parts held in a movable contact carrier, the movable contact parts forming a break contact and a make contact with fixed contact parts; and



a magnet system including an armature and a yoke, the yoke being elastically mounted in a closing direction of the magnet system, and, in an OFF position, the yoke being at a spacing of a magnet path from the armature, the yoke being elastically suspended so as to permit a movement of the yoke as far as closure of the magnet system after the magnet system has been switched on in a case of a welded break contact, the yoke being mounted via a volute spring inserted between the yoke and the coil form, a maximum resilience of the volute spring in the OFF position being at least as large as the spacing of the magnet path reduced by a resilience of the break contact.

6,040,751

BATTERY SECTION SWITCH

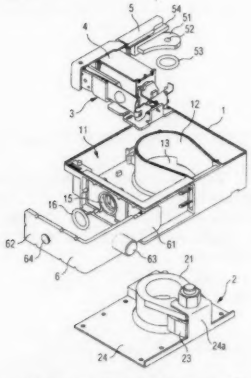
Thomas Haehnel; Juergen Breitlow-Hertzfeldt, both of Berlin; Bernd Saffian, Brandenbueg, and Josef Kern, Berlin, all of Germany, assignors to Siemens Electromechanical Components GmbH & Co. KG, Munich, Germany

Filed Jul. 20, 1999, Appl. No. 358,146

Claims priority, application Germany, Jul. 20, 1998, 198 32 573

Int. Cl.[7] H01H *3/00*

U.S. Cl. 335—185 **16 Claims**



1. A battery section switch for a load circuit of a vehicle battery, said battery section switch comprising:

a housing;

an electromagnet system having an armature and arranged in said housing;

an input lead adapted for connection to a terminal post of a vehicle battery;

an output lead connectable to a load circuit;

a contact carrier connected to said input lead and having a length and a movable contact, said contact carrier being switchable between an open position and a closed position and being pre-stressed into said open position by spring power;

a stationary contact connected to said output lead and in contact with said movable contact when said contact carrier is in said closed position, to produce a switched connection between said input lead and said output lead; and

a toggle spring device having a first lever attached to said contact carrier and having a second lever seated in said housing that are connected to form a toggle via a middle toggle link, said toggle being coupled to said armature and locking said contact carrier in said closed position in an approximately stretched condition of said toggle,

upon excitation of said electromagnet system, said armature releasing said locking between said toggle and said contact carrier, and

said contact carrier comprising an elongated contact spring having a first end clamped only to said housing and having a second end engaging an outer end of said first lever to form a rotary coupling, and said movable contact being carried in a middle region along said contact carrier length.

6,040,752

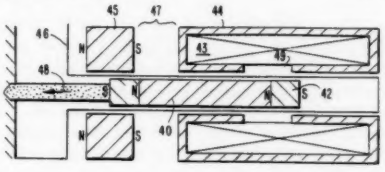
FAIL-SAFE ACTUATOR WITH TWO PERMANENT MAGNETS

Jack E. Fisher, 13 Amberly Ct., Gloucester, Ontario, Canada, K1J 8A2

Continuation-in-part of application No. 08/844,828, Apr. 22, 1997, abandoned. This application Jun. 18, 1998, Appl. No. 99,720.

Int. Cl.[7] H01F *7/00;7/08*

U.S. Cl. 335—234 **5 Claims**



1. An actuator comprising: a magnetizable yoke having a central aperture within which an armature made at least partly of soft iron reciprocates; a permanent ring magnet proximal one end of said yoke and having its central aperture coextensive with the central aperture of said yoke and having opposite sides of opposite polarity, the ring magnet being spaced a fixed distance from the yoke; said armature having a first permanent magnet affixed as part thereof near said ring magnet; said central aperture of said ring magnet sized to permit at least part of said first permanent magnet to pass into said ring magnet when moving to one of two open and closed reciprocating positions of the armature, the first permanent magnet in said one position being partially inside the ring magnet and in the other position being spaced away from the ring magnet, and the ring magnet interacting with said first permanent magnet such that when the armature is in each of the two said positions the first permanent magnet causes the armature to remain in that position, and said armature reciprocating between said open and closed positions upon momentary magnetization of said yoke by means of an electrical pulse having predetermined polarity.

6,040,753

ULTRA-LOW-PROFILE TUBE-TYPE MAGNETICS

Sriram Ramakrishnan, Clifton Park; Robert Louis Steigerwald, and William Hull Bicknell, both of Burnt Hills, all of N.Y., assignors to Lockheed Martin Corp., Moorestown, N.J.

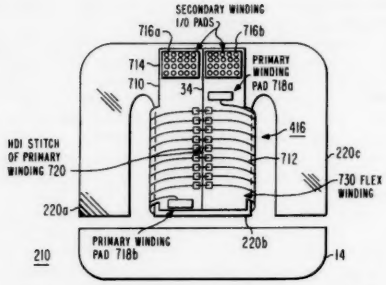
Filed Apr. 6, 1999, Appl. No. 287,157

Int. Cl.[7] H01F *5/00;27/28*

U.S. Cl. 336—223 **11 Claims**

1. A magnetically coupled winding structure, comprising:

a flat, magnetically permeable core including a flat first portion defining first and second broad sides and at least one peripheral edge, and also defining mutually parallel first and second slots extending inward from said edge, to thereby define a



central core portion lying generally between said first and second slots, and to also define first and second side core portions extending parallel with said central core portion, said magnetically permeable core further including a flat, magnetically permeable end portion coplanar with said first portion and magnetically coupled to said central core and to said first and second side core portions adjacent the ends of said slots;

a dielectric sheet defining first and second broad, flat, mutually opposed sides, said dielectric sheet including a first electrically conductive layer affixed to at least a substantial portion of said first side, and further including a second layer affixed to said second side of said dielectric sheet, said second layer including a plurality of elongated second electrical conductors, each of said plurality of elongated second electrical conductors defining first and second ends, and an axis of elongation extending between said first and second ends, with said axes of elongation of said second electrical conductors being mutually parallel, said dielectric sheet being curved in a generally cylindrical manner to thereby define a structure having the general shape of a flat tube defining first and second ends and having said first side of said dielectric sheet on the inner side of said flat tube, said flat tube defining a central axis, and being dimensioned to fit over said central core portion with said first end of said tube adjacent the juncture of said central core portion and said side core portions, and with said second end of said tube adjacent said end portion of said core, so that said first electrically conductive layer is formed into an electrically open single turn about said central core, and so that each of said second electrical conductors also defines an open single turn about said central core, with a first end of each of said elongated second electrical conductors adjacent a second end thereof, said first and second ends of said second electrical conductors being substantially coplanar with one of said first and second broad sides of said magnetically permeable core when said tube is fitted over said central portion of said core;

a flexible interconnection sheet overlying said one of said first and second sides of said magnetically permeable core and said first and second ends of said second elongated electrical conductors, said flexible interconnection sheet including a layer of electrically conductive material defining at least interconnections between said first and second ends of said elongated second electrical conductors, said interconnections being defined in a manner which electrically interconnects at least the first end of one of said elongated second electrical conductors to the second end of a nearby one of said elongated second electrical conductors, to thereby define a single continuous electrical conductor wound in multiple turns about said central core portion; and

electrically conductive means coupled to mutually adjacent portions of said electrically conductive first layer, to thereby define a single turn of electrical conductor about said central core portion of said magnetically permeable core.

6,040,754

THIN TYPE THERMAL FUSE AND MANUFACTURING METHOD THEREOF

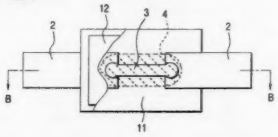
Toshiro Kawanishi, Osaka, Japan, assignor to Uchihashi Estec Co., Ltd., Osaka, Japan

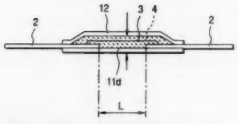
Filed Feb. 26, 1999, Appl. No. 258,255

Claims priority, application Japan, Jun. 11, 1998, 10-179675

Int. Cl.[7] **H01H** *85/046;85/044;69/02*

U.S. Cl. 337—297 **13 Claims**





1. A thin type thermal fuse comprising:

a resin base film;

a pair of belt-shaped lead conductors, tip portions of the pair of belt-shaped lead conductors being fixed on the resin base film;

a low melting-point fusible alloy piece coupled between the tip end portions of the belt-shaped lead conductors;

a flux applied on the low melting-point fusible alloy piece;

a resin cover film which is disposed on a one surface of the resin base film so that a space between said films at peripheries of both the resin cover film and the resin base film is sealed and a space between the resin cover film and the belt-shaped lead conductors is sealed;

wherein a relation of $(V/L)^{1/3}/d \leqq 1.8$ is satisfied, where a distance between the tip portions of the belt-shaped lead conductors is set to be L, a volume of the low melting-point fusible alloy piece is set to be V and a distance between a front surface of the resin base film and an inner surface of the resin cover film is set to be d.

6,040,755

CHIP THERMISTORS AND METHODS OF MAKING SAME

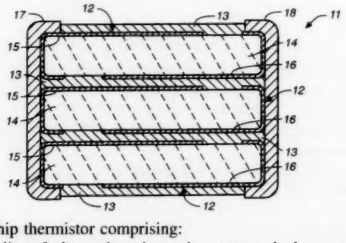
Yoshiaki Abe, and Toshiharu Hirota, both of Shiga, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 8, 1999, Appl. No. 327,906

Claims priority, application Japan, Jul. 8, 1998, 10-192832; Feb. 16, 1999, 11-037546

Int. Cl.[7] **H01C** *7/10*

U.S. Cl. 338—22 R **13 Claims**



1. A chip thermistor comprising:

a plurality of planar thermistor elements stacked one on top of another;

insulating layers each disposed between said thermistor elements and insulating one from the other of a different mutually adjacent pair of said thermistor elements; and

a pair of outer electrodes;

wherein each of said thermistor elements has a mutually oppositely facing pair of end surfaces, a mutually oppositely facing pair of main surfaces each extending between said pair of end surfaces, and a pair of inner electrodes;

wherein each of said insulating layers entirely covers the main surfaces of the corresponding pair of said thermistor elements;

wherein one of said inner electrodes is in part on one of said main surfaces and extends continuously onto one of said end surfaces and the other of said inner electrodes is in part on the other of said main surfaces and extends continuously onto the other of said end surfaces;

wherein said thermistor elements are stacked through the main surfaces to together form a stacked structure with a mutually oppositely facing outer surfaces;

wherein each of said outer electrodes is formed on a respective one of said outer surfaces and is electrically connected to a different one of the inner electrodes of each of said thermistor elements on an associated one of the end surfaces thereof; and

wherein the inner electrodes on different ones of said thermistor elements are electrically connected to each other only through one of said outer electrodes.

6,040,756

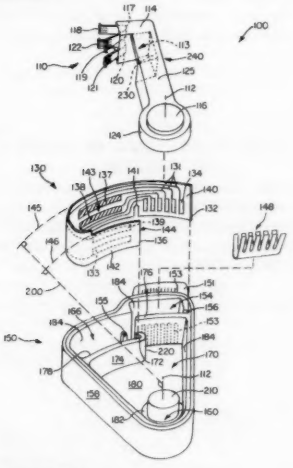
COMPACT POTENTIOMETER

Murray Kaijala, Elkhart, Ind., assignor to CTS Corproation

Filed Feb. 16, 1999, Appl. No. 250,621

Int. Cl.[7] H01C *10/30*

U.S. Cl. 338—160 **20 Claims**



1. A sensor comprising:

a) an electrically resistive track,

b) a collector track that is parallel and opposed to the electrically resistive track; and

c) a wiper having a first and second contact, the first and second contacts adjacently disposed and extending in opposite directions from each other, the wiper interposed between the resistive and collector tracks, the first contact wipably engaging the resistive track and the second contact wipably engaging the collector track.

6,040,757

VARIABLE RESISTOR

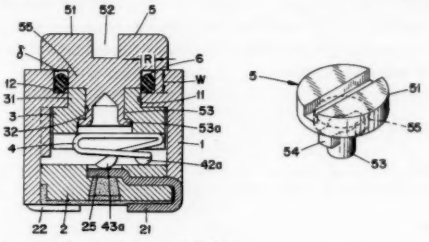
Fumitoshi Masuda, and Masashi Morikami, both of Fukui-ken, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Feb. 25, 1999, Appl. No. 257,530

Claims priority, application Japan, Mar. 3, 1998, 10-069549

Int. Cl.[7] H01C *10/30*

U.S. Cl. 338—160 **20 Claims**



1. A variable resistor comprising:

a case;

a rotatable rotor accommodated in the case;

a shaft projecting from an upper surface of the case being engaged with the rotor;

a resistance substrate having a collector electrode formed on the central portion of the surface thereof and a circular resistor formed concentrically on the periphery of the collector electrode being accommodated in the case; and

a slider having a first contact portion contacting the collector electrode and a second contact portion slidably contacting the resistor being provided with the rotor, wherein

the case includes a stepped surface on an upper surface of the case, the stepped surface supporting the peripheral surface and the bottom surface of an O ring,

the shaft includes a boss portion contacting the inner circumference of the O ring and an operating portion projecting from the upper surface of the case and covering the stepped surface of the case,

the inner and outer circumferences of the O ring are in compressed contact with the stepped surface of the case and the boss portion of the shaft, and

a gap is provided between either upper or lower end surface of the O ring and the stepped surface and the bottom surface of the operating portion.

6,040,758

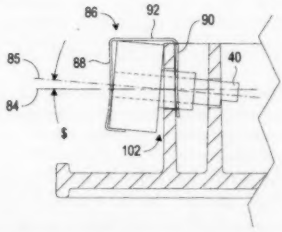
POTENTIOMETER MOUNTING CLIP FOR A JOYSTICK CONTROLLER

Thomas M. Sedor, Chicago, and Theodore Valavanis, Lake Forest, both of Ill., assignors to Midway Games Inc., Chicago, Ill.

Filed Nov. 6, 1998, Appl. No. 187,629

Int. Cl.[7] H01C *10/00*

U.S. Cl. 338—197 **13 Claims**



1. A potentiometer mounting system comprising:

a potentiometer defining a body portion and a shaft;

a support wall having an opening therein for accommodating the potentiometer shaft;

a mounting clip having front and back generally vertical resilent opposing side segments and a top segment bridging the front and back side segments;

wherein said potentiometer is secured to said support wall by a compressive force component applied by said mounting clip parallel-to take shaft, the body portion of said potentiometer and a portion of said support wall is received and retained between the front and back side segments of said mounting clip and the potentiometer shaft projects through the opening in said support wall.

6,040,759

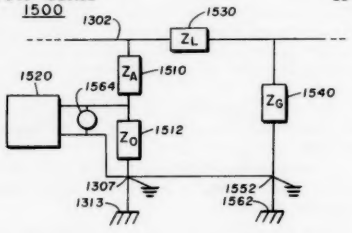
COMMUNICATION SYSTEM FOR PROVIDING BROADBAND DATA SERVICES USING A HIGH-VOLTAGE CABLE OF A POWER SYSTEM

Lelon Wayne Sanderson, 55 Spray Rd., Fayetteville, Tenn. 37334

Filed Feb. 17, 1998, Appl. No. 25,044

Int. Cl.[7] H04M *11/04*

U.S. Cl. 340—310.01 **18 Claims**



1. A multimedia communications system for providing an interactive broadband service between a distribution center and one or more remote locations where a high-voltage cable of an electrical power distribution system serves as a communication channel, the multimedia communications system comprising:

at the distribution center;

a media source with a media signal where the media signal has two or more types of information;

a distribution modem for receiving and modulating the media signal forming a radio-frequency signal where the distribution modem has a first terminal for coupling the radio frequency signal to the high-voltage cable and a second terminal connected to a neutral node at the distribution center;

a first coupler having one terminal connected to the first terminal of the distribution modem and a second terminal connected to the high-voltage cable; and

at the remote location;

a second coupler having a first terminal connected to the high-voltage cable and a second terminal for coupling and directing the radio-frequency signal from the distribution center to a remote modem, where the remote modem provides the media signal as an output.

6,040,760

CENTER CLUSTER MODULE AND SYSTEM, AND ELECTRICAL EQUIPMENT CONNECTOR SYSTEM

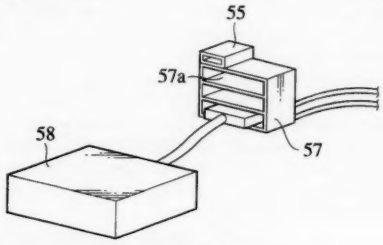
Ichiro Kataoka; Kunimitsu Aoki; Yoshiyuki Furuya; Junichi Matsushita; Hiroshi Nishiyama; Katsutoshi Nakajima; Akira Norizuki; Katsumi Murakami, and Takeyuki Amari, all of Numazu, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 27, 1998, Appl. No. 66,774

Claims priority, application Japan, Apr. 28, 1997, P9-111502; Apr. 2, 1998, P10-090240

Int. Cl.[7] B60Q *1/00*

U.S. Cl. 340—425.5 **19 Claims**



1. A center cluster module comprising:

equipment connection slots in and from which multiple pieces of electrical equipment installed in a vehicle are freely installed and removed;

a bus line that is provided at the back of said equipment connection slots to connect the multiple pieces of electrical equipment installed in said equipment connection slots;

a switch unit including multiple operating switches for producing control signals to control corresponding of the multiple pieces of electrical equipment, said operating switches being arranged on an external surface of said switch unit; and

a control unit for controlling, through said bus line when one is physically manipulated by a user to control a corresponding piece of electrical equipment, the piece of electrical equipment corresponding to said manipulated operating switch.

6,040,761

ACOUSTIC WARNING SYSTEM FOR MOTOR-VEHICLE SUBSYSTEM

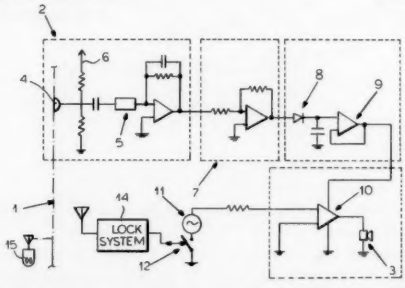
Ulrich Grasmann, Düsseldorf, Germany, assignor to Kiekert AG, Heiligenhaus, Germany

Filed Jun. 24, 1998, Appl. No. 103,312

Claims priority, application Germany, Jul. 4, 1997, 197 28 544; Oct. 16, 1997, 197 45 617

Int. Cl.[7] B60Q *1/00*

U.S. Cl. 340—425.5 **4 Claims**



1. In combination with a motor vehicle having a remotely operable subsystem, a system comprising:

an acoustic emitter on the vehicle set to emit a low-frequency sound to indicate a condition of the subsystem;

a microphone on the vehicle picking up ambient sound and producing an output corresponding thereto;

signal-processing means connected to the microphone and including a low-pass filter for filtering from the output sounds of a frequency above the low frequency of the emitter, an amplifier for amplifying the filtered output, and a rectifier for transforming the amplified filtered output into an analog output having a level corresponding to a level of low-frequency sounds picked up by the microphone;

an oscillator;

a variable-gain amplifier having an input connected to the oscillator and an output connected to the emitter; and

control means receiving the analog output from the rectifier and connected to the variable-gain amplifier for setting an output volume of the emitter proportional to the level of the analog output.

6,040,762

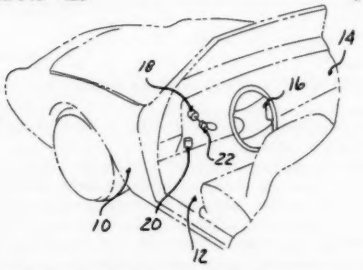
MAGNETIC SWITCH FOR AUTOMOTIVE SECURITY SYSTEM

Eugene Tompkins, 16016 E. Warren, Detroit, Mich. 48224

Provisional application No. 60/076,308, Feb. 27, 1998, Provisional application No. 60/047,726, May 27, 1997. This application May 27, 1998, Appl. No. 85,506.

Int. Cl.[7] **B60R** *25/10*

U.S. Cl. 340—426 **5 Claims**



1. A switching arrangement for arming and disarming a security system for a space having an exposed cover structure, comprising:

an arming switch mounted behind said covering structure for enabling operation of said security system, said arming switch including a tubular housing and a switching magnet in said housing movable to and from an arming location in said housing;

a pair of spaced conductors at said location which when electrically connected enable operations of said security system, means magnetically attracting said switching magnet to said position whereat said conductors are bridged and electrically connected by said magnet; and

a latching magnet adapted to be positioned over said structure at the location of said arming switch to draw said switching magnet to said latching magnet and away from said conductor to disarm said security system.

6,040,763

VEHICLE THEFT PREVENTION DEVICE WITH A LOW POWERED RECEIVER

Yoshiyuki Nakajima, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1997, Appl. No. 896,067

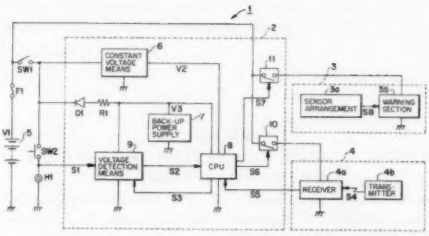
Claims priority, application Japan, Jul. 17, 1996, 8-187910

Int. Cl.[7] **B60R** *25/10*

U.S. Cl. 340—427 **20 Claims**

1. A theft prevention device for preventing theft of a vehicle, the theft prevention device comprising:

a theft prevention unit for sensing a disturbance of a vehicle, said theft prevention unit including an indicating device for



reporting a sensed disturbance, said theft prevention unit sensing disturbances while in an activated state and not sensing disturbances while in a deactivated stated;

a remote control having a transmitter for transmitting transmission signals including a deactivation signal;

a receiver, for mounting to the vehicle, operating to receive the deactivation signal in order to place said theft prevention unit in said deactivated state; and

an operating controller, for mounting to the vehicle, for normally placing said receiver in a disabled state, wherein said receiver does not respond to said transmission signals from said transmitter, said operating controller placing said receiver in an enabled state for a predetermined period of time after a predetermined operation of the vehicle has occurred, wherein said receiver responds to said transmission signals from said transmitter, said operating controller returning said receiver to said disabled state after said predetermined period of time has expired.

6,040,764

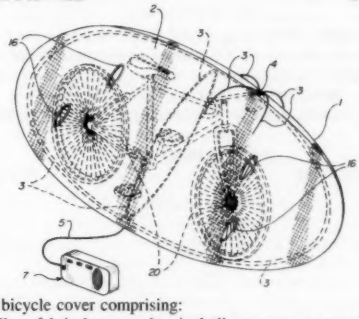
BICYCLE COVER WITH AN ATTACHABLE ALARM SYSTEM

Frances E. Crisci, 1828 Sweeney Ave., Las Vegas, Nev. 89104

Filed Apr. 9, 1998, Appl. No. 57,858

Int. Cl.[7] **B25R** *25/10*

U.S. Cl. 340—432 **6 Claims**



1. A bicycle cover comprising:

a hollow fabric bag member including a storage compartment dimensioned to receive a bicycle, said bag member having an opening for removably inserting a bicycle into the compartment;

a housing removably attachable to said bag member, said housing having an alarm means received therein for alerting a user when an unauthorized person is tampering with said bag member, said alarm means including a first circuit path including a motion switch means for detecting movement of said bag member; said motion switch means in communication with a timer and a sound emitting means for audibly signalling a user within a predetermined delay after said bag member and thus said motion switch means is manipulated;

a second circuit path formed with a plurality of electrically conductive cables integral with said bag member and in selective communication with said sound emitting means for audibly alerting a user when said cables are disconnected therefrom;

a display means on the exterior surface of said housing and in communication with said timer for visually indicating the status thereof.

6,040,765

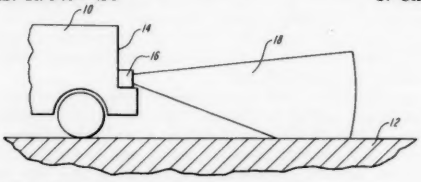
OBSTACLE DETECTION SYSTEM BUILT-IN TEST METHOD AND APPARATUS

James R. Cherry, Windham, N.H., and Abel Raynus, Malden, Mass., assignors to Armatron International, Inc., Melrose, Mass.

Filed Jan. 23, 1998, Appl. No. 12,785

Int. Cl.[7] B60Q *1/00;* **G01S** *15/00*

U.S. Cl. 340—436 **17 Claims**



1. An obstacle detection system, comprising:

an acoustic piezoelectric transducer;

means for applying an AC transmit signal to said acoustic piezoelectric transducer during a built-in-test (BIT) transmission period; and

means for sensing a vibration generated signal from said transducer during a BIT receive period during the absence of reflected ultrasonic energy associated with said acoustic piezoelectric transducer.

6,040,766

MOTOR VEHICLE NAVIGATION SYSTEM ARRANGEMENT

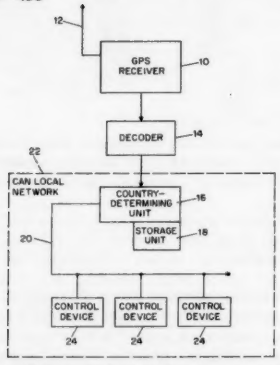
Andreas Lübke, Wolfsburg; Bernd Rech, Saarlouis, and Torsten Zawade, Peine, all of Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Jan. 20, 1999, Appl. No. 234,262

Claims priority, application Germany, Jan. 23, 1998, 198 02 595

Int. Cl.[7] B60Q *1/00*

U.S. Cl. 340—438 **11 Claims**



1. A motor vehicle navigation system arrangement comprising:

a receiver for receiving navigation data from a navigation system

an evaluation unit connected to the receiver for evaluating navigation data and providing position data relating to the current position of the vehicle;

a country-determining arrangement connected to the evaluation unit for determining the country in which the vehicle is currently located, and

a control arrangement responsive to the country-determining arrangement for setting at least one of a measuring unit for a speed indicator and a measuring unit for an indicator of distance traveled.

6,040,767

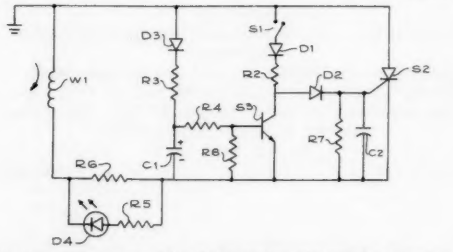
CONTROL SYSTEM FOR ENGINE LUBRICANT LEVEL SENSOR

Richard A. Dykstra, Cedar Grove, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jun. 19, 1997, Appl. No. 878,790

Int. Cl.[7] B60Q *1/00*

U.S. Cl. 340—450.3 **17 Claims**



1. A control system used with an engine lubricant level sensor, comprising:

a switch that closes when the engine has a low lubricant level during engine starting;

a start prevention circuit that prevents starting of the engine if said switch is closed during an attempted engine starting;

a disabler that disables said start prevention circuit only after engine starting during substantially all of the remaining time that the engine is operated before the engine is shut off; and

a winding that provides power to said disabler;

whereby the disabling means prevents the shutting down of the engine due to a low lubricant level after the engine has started.

6,040,768

ARRANGEMENT FOR MONITORING THE WEAR STATUS OF A FRICTION CLUTCH

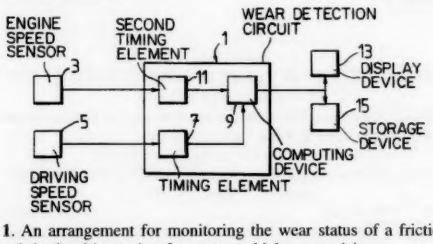
Hans-Jürgen Drexl, Schonungen, Germany, assignor to Mannesmann Sachs AG, Schweinfurt, Germany

Filed Mar. 8, 1999, Appl. No. 264,115

Claims priority, application Germany, Mar. 9, 1998, 198 10 033

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—453 **14 Claims**



1. An arrangement for monitoring the wear status of a friction clutch in the drive train of a motor vehicle, comprising:

a wear detection circuit for determining load information of the friction clutch;

a first speed sensor operatively connectable in the motor vehicle for detecting an instantaneous input speed of the friction clutch and transmitting a first speed information to said wear detection circuit in response to said input speed of the friction clutch;

a movement sensor operatively connectable to the motor vehicle for determining a beginning of a starting process and transmitting a beginning of starting process signal to said wear detection circuit; and

said wear detection circuit determining said load information from at least one value of said first speed information within a time period after receiving said beginning of starting process signal.

6,040,769

DETECTING DEVICE AND AN ALARM SYSTEM

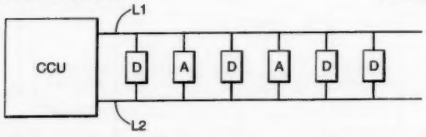
Roger Dennis Payne, Havant, United Kingdom, assignor to Apollo Fire Detectors Limited, United Kingdom

Filed Apr. 15, 1999, Appl. No. 292,199

Claims priority, application United Kingdom, Apr. 16, 1998, 9808094

Int. Cl.[7] **G08B** *29/00*

U.S. Cl. 340—506 **18 Claims**



1. A detecting device for connection to a pair of current supply lines to which at least one alarm device and a control unit is also connected, the control unit providing operating current on the supply lines for the detecting and alarm devices, the supply lines being used to signal a current drain in the detecting device as a fire detection signal, the detecting device operating when a first voltage is present on the supply lines, the alarm device operating when a second voltage, which is higher than the first voltage, is present on the supply lines; the detecting device comprising:

signalling device for producing a change of state signal from a quiescent state to an alarm state when a change in a condition or environment occurs, no such change occurring in the quiescent state;

terminals for connection to said supply lines;

a switch having high and low impedance states, said switch being connected across said terminals, said switch normally being in its high impedance state when the signalling device is in its quiescent state, but responding to said change of state signal from the signalling device so as to switch to the low impedance state, the low impedance state increasing current drain on the supply lines so that it is recognisable as the fire detection signal; and

a voltage responsive device which responds to said second voltage so as to cause said switch to switch to a high impedance state so that the line impedance across said terminals is increased so as to reduce the current drain and thereby conserve power.

6,040,770

COMMUNICATION PATH INTEGRITY SUPERVISION IN A NETWORK SYSTEM FOR AUTOMATIC ALARM DATA COMMUNICATION

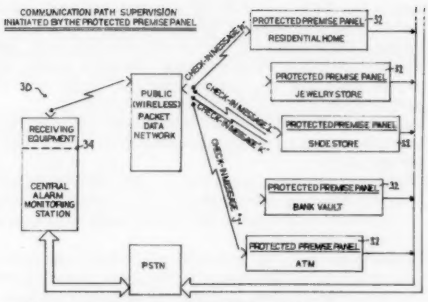
Rick A. Britton, 3319 S. Saratoga, Springfield, Mo. 65804

Provisional application No. 60/057,940, Sep. 5, 1997. This application Sep. 4, 1998, Appl. No. 148,438.

Int. Cl.[7] **G08B** *1/08*

U.S. Cl. 340—539 **17 Claims**

1. A method of communication path integrity supervision for a network system of automatic alarm data communication, comprising the steps of:



providing a network of communication paths;

providing a plurality of automatic alarm data transmitters on the network for transmitting alarm messages;

providing at least one receiver on the network for receiving the message traffic of the transmitters; and,

establishing a protocol between the receiver and the transmitters which achieves supervision of communication path integrity;

configuring the protocol on the transmitter-side to utilize processing circuitry and software for self-empowering any given transmitter to periodically test its ability to establish communication with the receiver by having a given transmitter:

generating a message of a next-appointed "check-in" time;

transmitting such message of a next-appointed "check-in" time to the receiver; and,

monitoring the elapse of time so that before the expiration of the "next-appointed check-in time" the given transmitter returns to the above step of generating a message, hence generating a succeeding message of a successor "next-appointed check-in time;"

configuring the protocol on the receiver-side to utilize processing circuitry and software for organizing the "check-in" message traffic from the transmitters in an appointment schedule by having it, the receiver:

for each received "check-in" message, scheduling or rescheduling an appointment in the appointment schedule for this transmitting transmitter for a next-appointed "check-in" time corresponding to this received "check-in" message; and

monitoring concurrently the appointment schedule against the passage of time for any occurrence of an unmet appointment, which signifies problems with integrity.

6,040,771

INTELLIGENT SAFE SYSTEM

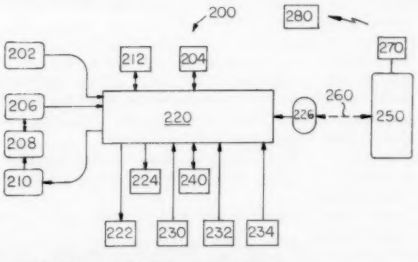
Jitae Kim, 23212 Park Corniche, Calabasas, Calif. 91302

Filed Sep. 30, 1996, Appl. No. 723,862

Claims priority, application Rep. of Korea, Dec. 2, 1995, 95-46144

Int. Cl.[7] **G08B** *13/08*

U.S. Cl. 340—545 **3 Claims**



1. An intelligent safe system, comprising:

a safe door locking means (**208**);

a central processing unit (**220**) for operating said door locking means to the door-unlocked condition;

a memory (**204**) coupled to said central processing unit, said memory comprising stored activation codes for activating said central processing unit, and a stored deactivation code for cancelling the action of the stored activating codes;

a data entry device (**202**) coupled to said central processing unit for delivering user-generated actuation codes to said central processing unit;

said central processing unit having a code-comparing capability for delivering an operating signal to said door-locking means when a user-generated activation code is the same as a stored activation code;

a remotely-accessed data transmission telephone means comprising a modem (**226**) coupled to said central processing unit for delivering an owner-generated deactivation code from a remote area to said central processing unit;

said telephone means comprising a telephone transmitter and means for inputting a DTMF tone deactivation code to said telephone transmitter for delivery to said modem;

said central processing unit having a code-comparing capability for comparing the owner-generated deactivation code with the stored deactivation code, to produce an override signal when the owner-generated deactivation code and the stored deactivation code are the same;

said central processing unit being responsive to said override signal to cancel any operating signal that might otherwise produce a door-unlocking action.

6,040,772

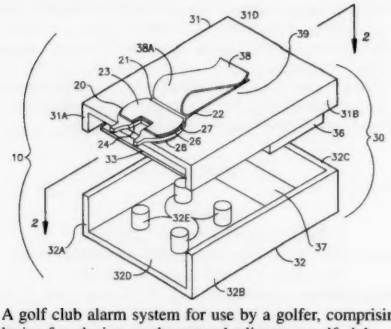
ALARM SYSTEM FOR FORGOTTEN GOLF CLUB

Susan M. Jackson; Robert A. Jackson, both of 10100 Hobby Hill Rd., Richmond, Va. 23235, and John M. Davis, 12418 Queensgate Rd., Midlothian, Va. 23113

Filed Sep. 25, 1998, Appl. No. 161,070

Int. Cl.[7] G08B *13/14*

U.S. Cl. 340—568.6 **20 Claims**



1. A golf club alarm system for use by a golfer, comprising:

a device for placing on the ground adjacent a golf club;

a radio transmitter mounted in said device, said radio transmitter being powered by a rechargeable transmitter power source for transmitting a coded transmission;

said device and radio transmitter being of small size and also functioning as a divot tool or golf club handle rest;

a radio receiver for carrying with a golfer tuned to receive said coded transmission, said radio receiver including circuitry that generates an alarm signal whenever said transmitted coded transmissions drops below a threshold level;

at least one alarm device coupled to said circuitry for generating at least one golfer-detectable alarm when said alarm signal is supplied thereto;

a power source coupled to said radio receiver for supplying power thereto;

an electrical coupling having a first portion mounted on said radio transmitter and electrically connected to said transmitter power source, said electrical coupling further having a second portion mounted on said radio receiver and electrically connected to said power source wherein, when said first portion and said second portion are electrically coupled to one another, said transmitter power source is electrically connected to said power source for receiving a charging current; and

said receiver having in said circuitry an automatic cut-off of said golfer-detectable alarm after a predetermined time.

6,040,773

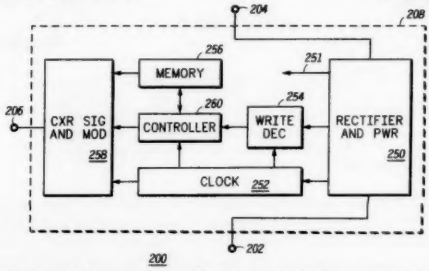
RADIO FREQUENCY IDENTIFICATION TAG ARRANGED FOR MAGNETICALLY STORING TAG STATE INFORMATION

Victor Allen Vega, Hercules, and Noel H. Eberhardt, Cupertino, both of Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of application No. 08/540,813, Oct. 11, 1995. This application Mar. 12, 1998, Appl. No. 41,480.

Int. Cl.[7] G08B *13/181*

U.S. Cl. 340—572.1 **92 Claims**



20. A radio frequency identification tag including a tag circuit, a tag common electrode, a first tag antenna element and a second tag antenna element, the tag common electrode, the first tag antenna element and the second tag antenna element coupled to the tag circuit,

the tag common electrode arranged for coupling to ground,

the first tag antenna element arranged for electrostatically receiving an exciter signal from a proximately-located electrostatic exciter and coupling the exciter signal to the tag circuit,

the tag circuit arranged for becoming energized based on the exciter signal,

generating a read signal and coupling the read signal to the second tag antenna element,

the second tag antenna element arranged for electrostatically sending the read signal to a proximately-located electrostatic reader,

exactly one of the tag common electrode, the first tag antenna element and the second tag antenna element arranged for magnetically storing tag state information such that the tag state information can be magnetically read by a proximately-located magnetic reader, the tag state information comprising exactly one state of two possible states; and

the read signal being a transmitted signal.

6,040,774

LOCATING SYSTEM AND METHOD EMPLOYING RADIO FREQUENCY TAGS

Jonathan Lloyd Schepps, Princeton, N.J., assignor to Sarnoff Corporation, Princeton, N.J.

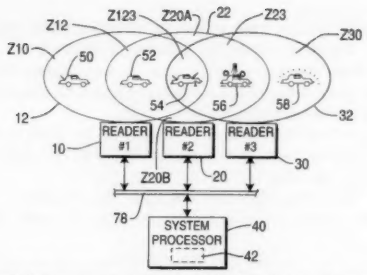
Filed May 27, 1998, Appl. No. 85,410

Int. Cl.[7] G08B *13/14*

U.S. Cl. 340—572.1 **29 Claims**

1. Apparatus for locating a tag comprising:

at least first and second readers each having a respective coverage area in which a tag can be identified, wherein at least a



part of the coverage area of said first reader overlaps at least a part of the coverage area of said second reader; and

a processor responsive to said first and second readers to identify a tag located in one of (a) the overlap of the coverage areas of said first and second readers and (b) in the coverage area of said first reader but not in the coverage area of said second reader.

6,040,775

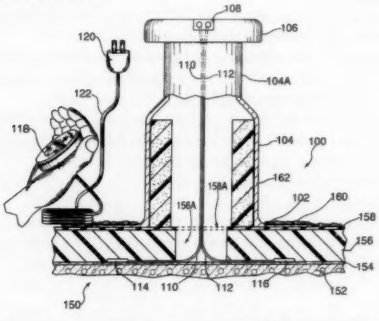
ROOF VENTS WITH MOISTURE DETECTORS AND ROOF SYSTEMS INCORPORATING SAME

Andrew J. Nill, Jr., 44A Lewis Ct., Huntington Station, N.Y. 11746

Filed May 19, 1998, Appl. No. 81,177

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—604 **17 Claims**



1. A roof vent system for use in a roof having a plurality of layers of roofing material including a waterproof membrane, said roof vent system comprising:

a) a base flange dimensioned to fit in between two of the plurality of layers of roofing material;

b) an upstanding hollow member having an interior which hollow member is coupled to said base flange and terminating in a cap, said upstanding hollow member and said cap defining an annular opening into the interior of said hollow member;

c) a portable, battery-operated moisture indicating device having a first electrical connector;

d) electrical connector means mounted in one of said hollow member and said cap for releasably connecting with said first electrical connector; and

e) at least one moisture sensing element electrically coupled to said electrical connector means and permanently mounted on one of the plurality of layers of roofing material.

6,040,776

COLLECTION OF PROCESS EFFLUENT

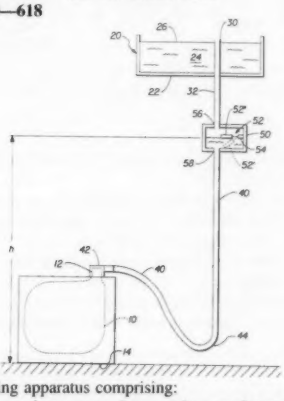
Edward Charles Glover, London, and Martyn Stuart Glover, Watford, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1996, Appl. No. 633,236

Claims priority, application United Kingdom, Apr. 18, 1995, 9507844

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—618 **16 Claims**



1. Processing apparatus comprising:

(a) a first container arranged to supply a predetermined volume of processing solution to a processing tank;

(b) a sealed flexible container comprising a "bag-in-box" arrangement having an outer liquid-tight container inside which a flexible bag is located;

(c) an inlet pipe connected to the flexible container via a self sealing, dry-break connector for conducting effluent processing solution from the processing tank to the flexible container; and

(d) an alarm system comprising a sensor arranged at a predetermined height h above the base of the sealed flexible container to provide an alarm signal when the level of the solution in the pipe has reached the height h to produce a pressure head determined by the height h corresponding to the flexible container being overfilled to a predetermined pressure.

6,040,777

DEVICE AND PROCESS FOR INDICATING THE EXHAUSTION OF A FILTER

Klaus Ammann, Sereetz, and Wolfgang Bäther, Lübeck, both of Germany, assignors to Drager Sicherheitstechnik GmbH, Germany

Filed May 27, 1999, Appl. No. 321,465

Claims priority, application Germany, Oct. 28, 1998, 198 49 900

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—632 **8 Claims**

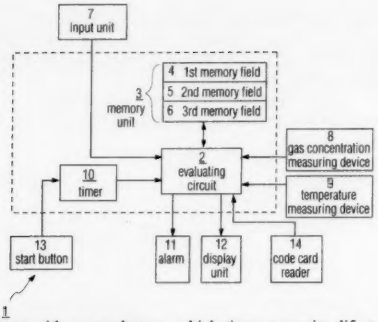
1. A device for determining the exhaustion of an adsorption filter for toxic gases in the ambient air, the device comprising:

a gas concentration-measuring device for determining the toxic substance content in the ambient air;

a temperature-measuring device for determining the temperature of the ambient air;

a memory unit with a first memory field, in which filter data sets associated with adsorption filters are stored, with a second memory field, in which data sets for the toxic substance to be adsorbed are contained, and with a third memory field, which contains preset values for the ambient air humidity and the respiratory minute volume,

an input unit for selecting the preset values from at least said first memory field, said second memory field and said third memory field;



a timer with a start button, which times a service life t of the adsorption filter;

an evaluating circuit, which determines the maximum service life t_{max} from the selected preset values, the toxic substance content in the ambient air and the temperature of the ambient air and forms a remaining capacity of the adsorption filter from the difference t_{max} minus t; and

an indicator for generating a filter exhaustion indication when the remaining capacity is lower than or equal to a preset limit value.

6,040,778

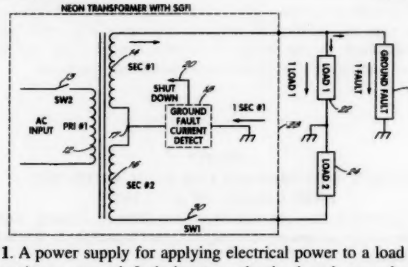
NEON POWER SUPPLY WITH MIDPOINT GROUND DETECTION AND DIAGNOSTIC FUNCTIONS

William Thomas Hopkins; David Henrik Riesland, and Anthony William Banks, all of Dickson, Tenn., assignors to France/Scott Fetzer Company, West Fairview, Tenn.

Filed Apr. 20, 1998, Appl. No. 63,475

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—650 **22 Claims**



1. A power supply for applying electrical power to a load while detecting a ground fault between the load and ground and/or connection of a load midpoint to ground, comprising:

first and second power terminals for connection to the load for applying electrical power thereto,

a ground terminal for connection to an earth ground connection,

a power application circuit connected to the first and second power terminals and the ground terminal, wherein in a test mode the power application circuit applies electrical power to the first power terminal relative to the ground terminal while applying substantially no electrical power to the second power terminal relative to the ground terminal, and in an operative mode the power application circuit applies electrical power to both the first and second power terminals relative to the ground terminal,

a ground fault detection circuit connected to the ground terminal for detecting electrical current flow between the ground terminal and the power application circuit, and for generating an electrical signal indicating the presence of a ground fault upon detection of current flow between the ground terminal and the power application circuit.

6,040,779

METHOD AND CIRCUIT FOR MONITORING THE FUNCTIONING OF A SENSOR BRIDGE

Georg Pfaff, Markgroeningen, and Herbert Keller, Wiernsheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

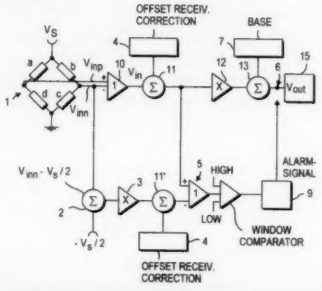
PCT No. PCT/DE98/01698, § 371 Date Feb. 24, 1999, § 102(e) Date Feb. 24, 1999, PCT Pub. No. WO99/01777, PCT Pub. Date Jan. 14, 1999

PCT Filed Jun. 19, 1998, Appl. No. 242,804

Claims priority, application Germany, Jul. 3, 1997, 197 28 381

Int. Cl.[7] G08B *21/00*

U.S. Cl. 340—661 **12 Claims**



1. A method for monitoring the function of a symmetrical sensor bridge circuit (**1**) having sensor elements (a, b, c, d), which are connected in a full bridge circuit and are supplied by a bridge supply voltage

characterized by the following steps:

derivation of a full bridge signal (V_{in}) from the sensor bridge circuit;

derivation of a half-bridge signal (V_{inp}, V_{inn}) from the positive or the negative half-bridge circuit;

subtraction of the instantaneous level of the half-bridge signal (V_{inp}, V_{inn}) from half the bridge supply voltage ($V_s/2$) while forming a difference signal ($V_{inn}-V_s/2$);

amplification of the difference signal by a defined amplification factor (x), so that it corresponds to the full bridge signal (V_{in}) if the sensor bridge circuit (**1**) operates correctly;

comparison of the full bridge signal (V_{in}) with the amplified difference signal; and

generation of an alarm signal if the amplified difference signal deviates from the full bridge signal (V_{in}) in an unacceptable manner.

6,040,780

CHILD'S PERSONAL SECURITY ASSISTANT

Michael Lucas, 146 Quassaic Ave., New Windsor, Mass. 12553

Filed Dec. 9, 1998, Appl. No. 208,513

Int. Cl.[7] G08B *3/00*

U.S. Cl. 340—691.1 **9 Claims**

1. A child's personal security assistant, comprising:

an electrically powered stand;

a body removeably mated with said stand, and connected electrically thereto, and further comprising:

a front;

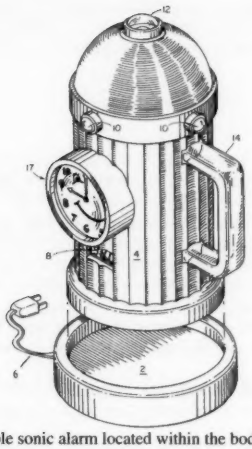
a timer located on the body, with a readout visible from the front;

electrical storage means located within the body;

means for recharging the storage means;

one or more switchable strobe lights located on the outside of the body,

and powered by the storage means;



a switchable sonic alarm located within the body and powered by the storage means;

means to detect removal of the body from the stand; and

means to communicate said removal to the timer, strobe lights, and sonic alarm, switching them on thereby.

6,040,781

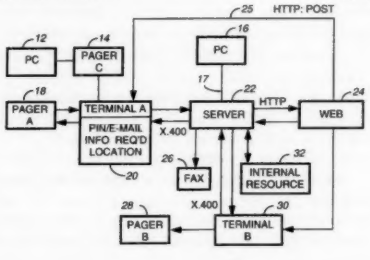
EVENT REMINDER FOR A COMMUNICATION DEVICE

Bradley A. Murray, West Palm Beach, Fla., assignor to Motorola, Schaumburg, Ill.

Filed May 26, 1998, Appl. No. 83,930

Int. Cl.[7] H04Q *7/14*

U.S. Cl. 340—825.22 **20 Claims**



10

1. A method for prompting a user to change a mode of operation of an electronic device based on an updated event time, the method comprising the steps of:

maintaining a clock within the electronic device;

storing an event time in a memory coupled to the electronic device;

prompting a user of the electronic device within a predetermined time of the event time to request a wireless update of the event time; and

updating the electronic device with the event time if requested by the user by wirelessly retrieving data from an independent widely distributed information source.

6,040,782

RADIO SIGNAL RECEIVING APPARATUS WITH AUDIO SIGNAL RECEIVING AND REPRODUCING FUNCTION

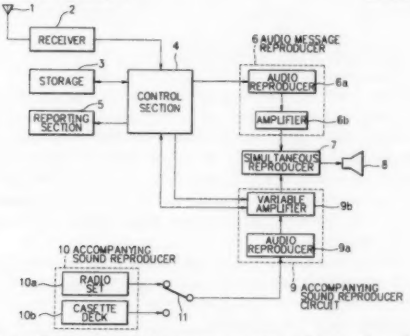
Satoshi Banno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1997, Appl. No. 956,721

Claims priority, application Japan, Oct. 23, 1996, 8-280841

Int. Cl.[7] G08B *5/22*

U.S. Cl. 340—825.25 **15 Claims**



1. A radio signal receiving apparatus with audio signal receiving and reproducing function, comprising:

a receiver section for receiving a message signal sent from an external device, converting said message signal into an audio signal, and outputting said audio signal therefrom;

a message reproducer circuit for conducting a reproducing operation for said audio signal from said receiver section and outputting therefrom an audio signal thus reproduced;

an accompanying sound reproducer circuit for conducting a reproducing operation for an audio signal fed from an accompanying sound reproducer and outputting therefrom an audio signal reproduced through the operation;

output means for receiving said audio signals respectively from said message reproducer circuit and said accompanying sound reproducer circuit and outputting audio sound corresponding to said audio signals; and

a simultaneous producer section for mixing said audio signal from said message reproducer circuit with said audio signal from said accompanying sound reproducer circuit and delivering a signal resultant from the mixing operation to said output means,

the accompanying sound reproducer circuit automatically changing, when said message signal is inputted to said receiver section, a sound volume of said audio signal to a prescribed sound volume value.

6,040,783

SYSTEM AND METHOD FOR REMOTE, WIRELESS POSITIVE IDENTITY VERIFICATION

Robert C. Houvener, Nashua; Ian P. Hoenisch, Salem, and Joseph Schappler, Bedford, all of N.H., assignors to Image Data, LLC, Nashua, N.H.

Continuation-in-part of application No. 08/684,677, Jul. 19, 1996, Pat. No. 5,790,674, which is a continuation-in-part of application No. 08/436,146, May 8, 1995, Pat. No. 5,657,389.

This application Nov. 10, 1997, Appl. No. 966,520.

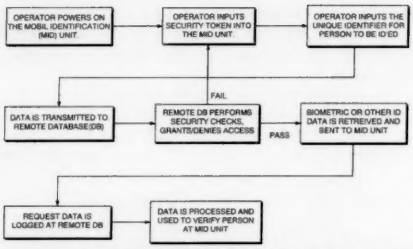
This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *7/04*

U.S. Cl. 340—825.31 **9 Claims**

1. A mobile positive identification system comprising:

at least one remote database site having stored therein a database comprising a plurality of access authority information units corresponding to authorized users of the system and a database comprising a plurality of digital photographic images of persons to be identified;


OPERATOR POWERS ON THE MOBIL IDENTIFICATION (MID) UNIT.
OPERATOR INPUTS SECURITY TOKEN INTO THE MID UNIT.
OPERATOR INPUTS THE UNIQUE IDENTIFIER FOR PERSON TO BE ID'ED
FAIL
DATA IS TRANSMITTED TO REMOTE DATABASE(DB)
REMOTE DB PERFORMS SECURITY CHECKS, GRANTS/DENIES ACCESS
PASS
BIOMETRIC OR OTHER ID DATA IS RETRIEVED AND SENT TO MID UNIT
REQUEST DATA IS LOGGED AT REMOTE DB
DATA IS PROCESSED AND USED TO VERIFY PERSON AT MID UNIT

a mobile point of identification terminal having an access authority information unit input for inputting an access authority information unit presented by a user of the system, an identifying information input for accepting identifying information presented by a person to be positively identified at said mobile point of identification terminal and a display device for displaying digital photographic images of persons to be identified;

a communications link, linking said mobile point of identification terminal to said at least one remote database, wherein said communications link is comprised, at least in part, of a wireless communications link;

a means for verifying that said point of identification terminal is authorized to access said remote database site; and

a means for verifying that said user of said system has compared the digital photographic images displayed on the display means with the physical appearance of the person being identified at the point of identification terminal and that a match exists between at least one of said digital photographic images and the physical appearance of said person being identified.

6,040,784

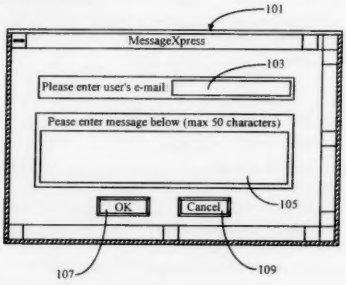
ALPHANUMERIC PAGING MESSAGE SYSTEM OPERATING ON INTERNET

Nicholas R. Miller, West Vancouver, Canada, assignor to Datalink Systems Corporation, San Jose, Calif.

Filed Mar. 7, 1997, Appl. No. 813,925

Int. Cl.[7] G08B *5/22*

U.S. Cl. 340—825.44 **9 Claims**



1. A message delivery system, comprising:

a WEB page on a WEB Server having an input window on the WEB page, the input window comprising a first input text field for entering identity of an intended recipient, and a second input text field for entering an alphanumeric message;

a pager message preparation facility operating on the WEB server integrating the identifier and message from the input windows on the WEB page with data retrieved from a database, matching routing information for the intended recipient with the identifier, thereby providing a pager message for the intended recipient; and

a pager message sending facility sending the prepared pager message to a paging system to be transmitted to a pager associated with the intended recipient.

6,040,785

MIXED LOCK TYPE TOLL COLLECTING SYSTEM AND METHOD FOR TOLL COLLECTION OF VEHICLES ON TOLL ROAD

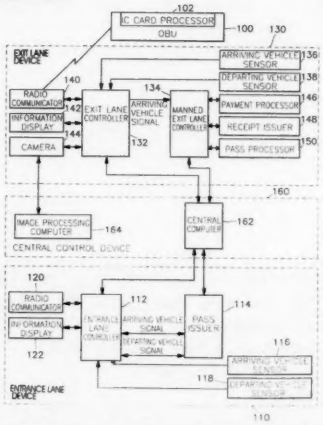
Won-seo Park, 221-1102 Woosung Sibeom Apt., Seohyun-dong Bundang-gu, Sungnam-city, Kyungki-do; Wan-chol Ho, 102-2001 Hankook Apt., Yeokgok-dong, Wonmi-gu, Bucheon-city, Kyungki-do; Duk-Kyun Ryu, 249-204 Jugong Apt., Wonmoon-dong, Kwacheon-city, Kyungki-do, and Jong-yeob Kim, 605-102 Chowon Hanyang Apt., Pyeongchon-dong, Dongan-gu, Anyang-city, Kyungki-do, all of Rep. of Korea

Filed Feb. 25, 1998, Appl. No. 30,320

Claims priority, application Rep. of Korea, Apr. 18, 1997, 97-14459

Int. Cl.[7] G08G *1/00*

U.S. Cl. 340—928 **25 Claims**



1. A mixed lock-type toll collecting system, comprising:

an on-board unit for installation in a vehicle for toll collection at a toll gate of a toll road;

an entrance lane device for installation at an entrance lane of said toll gate of the toll road for transmitting entrance information to the vehicle entering the entrance lane;

an exit lane device for installation at an exit lane of said toll gate of the toll road for collecting a toll from the vehicle exiting the exit lane;

a central control device for controlling said entrance lane device and said exit lane device for toll collection from the vehicle entering the entrance lane and exiting the exit lane of the toll road;

said entrance lane device comprising a first radio communicator performing radio communication with said on-board unit when installed in the vehicle which enters the entrance lane and transmitting the entrance information to said on-board unit when installed in the vehicle which enters the entrance lane when radio communication with the vehicle can be performed, and including a pass issuer issuing a pass to a driver of a vehicle when radio communication with the vehicle cannot be performed; and

said exit lane device comprising a second radio communicator performing radio communication with said on-board unit when installed in the vehicle upon exiting and collecting the toll, when radio communication with the vehicle can be performed; and

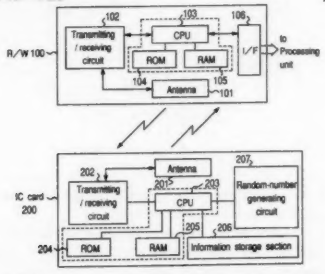
a manned exit lane device for installation collecting the toll in accordance with the pass issued to the driver of the vehicle, when radio communication with the vehicle can not be performed.

6,040,786

RECOGNITION SYSTEM AND RECOGNITION METHOD FOR NON-CONTACT IC CARDS

Shuzo Fujioka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1998, Appl. No. 116,196
Claims priority, application Japan, Jan. 16, 1998, 10-006463
Int. Cl.[7] G08G *1/00*
U.S. Cl. 340—928 **10 Claims**



1. A recognition system for non-contact IC cards comprising a plurality of non-contact IC cards and a reader/writer that recognizes said non-contact IC cards,

each of said non-contact IC cards having a first response signal transmitting means for immediately transmitting a first response signal to a predetermined time slot in response to a first polling trial by said reader/writer and a second response signal transmitting means for transmitting a second response signal to a time slot randomly selected from a predetermined number of succeeding time slots, in response to a subsequent polling trial by said reader/writer and

said reader/writer having a polling means for receiving the first response signal from each of said non-contact IC cards at the predetermined time slot during the execution of the first polling trial and receiving respective second response signals from said non-contact IC cards at the predetermined number of succeeding time slots during the execution of the subsequent polling trial.

6,040,787

LASER VEHICLE PARKING APPARATUS

Lamoyne W. Durham, 1844 Stonebridge Dr., Saline, Mich. 48176

Filed Dec. 3, 1998, Appl. No. 205,108
Int. Cl.[7] B60Q *1/48*
U.S. Cl. 340—932.2 **19 Claims**

1. A device for parking a vehicle having a windshield at a desired distance relative to a surface forward of the vehicle, comprising:

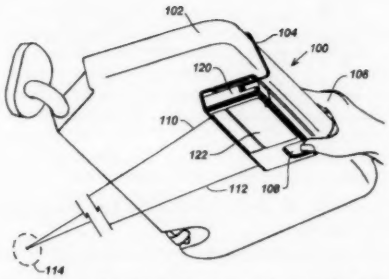
an enclosure;

a laser outputting a primary beam of light within the enclosure;

an optical element disposed in the path of the primary beam to establish first and second beams which exit the enclosure;

a beam-shaping element causing at least one of the first and second beams to appear as a line on the surface forward of the vehicle;

a adjustment means for angling one or both of the first and second beams so as to converge in a region of the surface forward of the vehicle when the vehicle is positioned at a desired distance therefrom; and



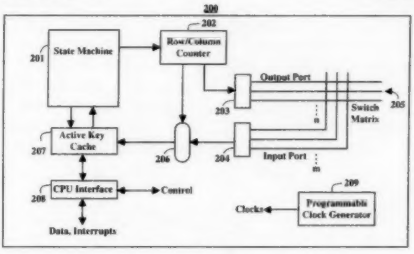
means for mounting the enclosure to a visor within the vehicle such that the first and second beams pass through the windshield.

6,040,788

CACHE BASED SCAN MATRIX KEYBOARD CONTROLLER

Peter Chambers, and Omer Lem Wehunt, Jr., both of Phoenix, Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jan. 21, 1998, Appl. No. 10,217
Int. Cl.[7] H03M *11/00*
U.S. Cl. 341—26 **18 Claims**



1. A keyboard controller system comprising:

a keyboard with a plurality of keys;

a key matrix coupled to the plurality of keys for generating a signal when one of said plurality of keys is activated;

an output port coupled to the matrix;

an input port coupled to the matrix;

a cache memory component that receives signals from the key matrix wherein the cache stores the signal and identifies which of the plurality of keys is actuated; and

a state machine coupled to the cache memory and the key matrix wherein the state machine efficiently controls the keyboard.

6,040,789

DATA CONVERSION SYSTEM

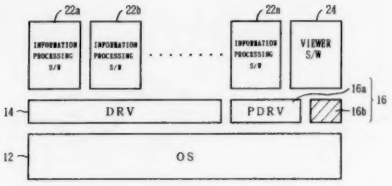
Takanobu Nishida, and Ichiro Jikuhara, both of Tokyo, Japan, assignors to Nippon Steel Corp., Tokyo, Japan

Filed Oct. 27, 1997, Appl. No. 958,395
Claims priority, application Japan, Oct. 24, 1996, 284956
Int. Cl.[7] H03M *7/00*
U.S. Cl. 341—50 **24 Claims**

1. A data conversion apparatus, comprising:

conversion means for converting original data created by any of a plurality of different information processing programs into printer output format data;

means for converting the printer output format data to data of a predetermined common format;



means for storing the common format data and the corresponding original data; and

means for visually displaying the stored common format data.

6,040,790

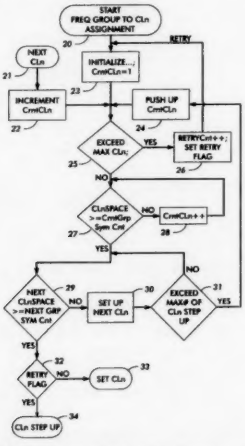
METHOD OF BUILDING AN ADAPTIVE HUFFMAN CODEWORD TREE

Simon M. Law, Torrance, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1998, Appl. No. 87,389

Int. Cl.[7] H03M *7/40*

U.S. Cl. 341—65 **4 Claims**



1. A method of building an adaptive Huffman codeword tree for input symbols comprising the steps of:

a) creating a number of bands to continuously cover all frequencies of use from least to most used symbols,

b) assigning a number of codeword bits to each band, lower numbers being assigned to higher frequencies,

c) assembling all symbols into a list in order of frequency of use, and assigning each symbol to a group so that the frequency of each symbol falls within the band of the group,

d) if there is enough space in a current group for all symbols assigned to the group, assign to each symbol a current codeword, and increment the codeword for each symbol,

f) if there is enough space in the current group for all of the remaining symbols, assign to each remaining symbol a current codeword and increment the codeword, and

g) if the current symbol is the last symbol of a group, increment the codeword, add a zero to the end of the codeword to start a new group, and go back to step d).

6,040,791

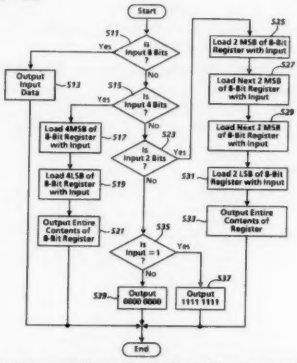
SYSTEM AND METHOD FOR GREY VALUE EXPANSION OF PIXEL DATA

Gary W. Kassmann, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1994, Appl. No. 340,785

Int. Cl.[7] G06K *9/00*

U.S. Cl. 341—95 **14 Claims**



1. A circuit for expanding a byte of pixel image data having a bit resolution of at least two bits, comprising:

detecting means for detecting a bit resolution of the byte of pixel image data, the bit resolution of the byte of pixel image data being equal to an integer N; and

new pixel generating means for generating a new pixel image data byte having a predetermined bit resolution, the predetermined bit resolution being equal to an integer M, in response to said detecting means detecting that the bit resolution of the byte of pixel image data is less than the predetermined bit resolution, the new pixel image data byte being a compilation of the byte of pixel image data repeated M/N times in the compilation, M/N being an integer.

6,040,792

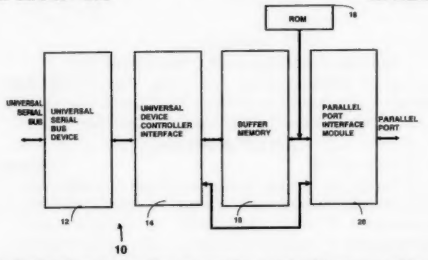
UNIVERSAL SERIAL BUS TO PARALLEL BUS SIGNAL CONVERTER AND METHOD OF CONVERSION

Lynn R. Watson; James E. Castleberry; David D. Luke, and David C. Gilbert, all of Boise, Id., assignors to In-System Design, Inc., Boise, Id.

Filed Nov. 19, 1997, Appl. No. 974,736

Int. Cl.[7] H03M *9/00*

U.S. Cl. 341—100 **21 Claims**



1. A signal converter, for converting a serial bit stream of data, including command data, interrupt request data and data packets, encoded in a Uniform Serial Bus communications protocol, from a host, into data encoded in a communications protocol compliant with IEEE 1284 specifications for retransmission to a parallel port, which comprises:

means for receiving a serial bit stream of data from a host in a Uniform Serial Bus communications protocol;

means for extracting data bytes from the serial bit stream of data from the Uniform Serial Bus communications protocol; and

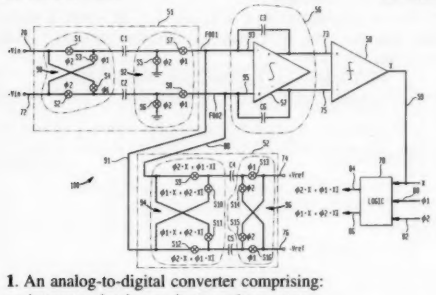
means for transmitting the data bytes in a communications protocol which complies with an IEEE 1284 specifications communications protocol to a parallel port.

6,040,793

SWITCHED-CAPACITOR SIGMA-DELTA ANALOG-TO-DIGITAL CONVERTER WITH INPUT VOLTAGE OVERLOAD PROTECTION

Paul F. Ferguson, Jr., N. Andover, and James Wilson, Sharon, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Mar. 18, 1998, Appl. No. 40,620
Int. Cl.[7] H03M *3/00;1/12*
U.S. Cl. 341—143 **10 Claims**



1. An analog-to-digital converter comprising:

an integrator having an input and an output;

a switched-capacitor input circuit having an input capacitor, the input circuit connectable to the input of the integrator, for charging the input capacitor by an input voltage during each of first and second non-overlapping time intervals and for transferring charge from the input capacitor to the integrator during only one of the first and second time intervals; and

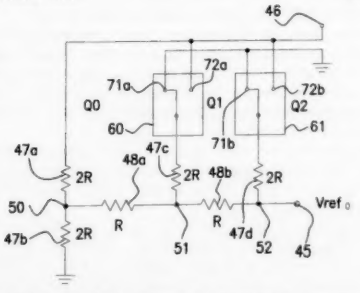
a switched-capacitor feedback circuit having a feedback capacitor, said feedback circuit connected in a feedback path between the input and output of the integrator, for charging the feedback capacitor by a feedback reference voltage during each of the first and second time intervals and for transferring charge from the feedback capacitor to the integrator during each of the first and second time intervals.

6,040,794

HIGH-SPEED ANALOG-TO-DIGITAL CONVERTER

Jerry Jaw, Hsinchu Hsien, Taiwan, assignor to United Microelectronics Corp., Taiwan

Filed Apr. 14, 1998, Appl. No. 60,427
Claims priority, application Taiwan, Dec. 19, 1997, 86221135
Int. Cl.[7] H03M *1/12*
U.S. Cl. 341—155 **6 Claims**



1. An analog-to-digital converter apparatus for converting an input analog signal into an n-bit digital data represented by binary data bits Q_{n-1}, Q_{n-2}, . . . , Q_0 with Q_{n-1} being the most significant bit and Q_0 the least, the converter comprising:

a plurality of n reference voltage supply circuits each generating a corresponding reference voltage $Vref_{n-1}$, $Vref_{n-2}$, . . . , $Vref_0$ based on a maximum reference voltage V_{max}, and each of the n reference voltage supply circuits being connected across the maximum reference voltage and the system ground potential, wherein

a first of the n reference voltage supply circuits is a first resistor network that includes a first series-resistor network having two resistors connected in series, with one terminal of the first series-resistor network connected to the maximum reference voltage and the other terminal of the first series-resistor network connected to a system ground potential, and a junction between the tow resistors of the first series-resistor network supplying the first voltage $Vref_{n-1}$; and

a second of the n reference voltage supply circuits is a second resistor network that includes a first series-resistor network for the first of the n reference voltage supply circuits, a second series-resistor network having two resistors connected in series, with one terminal of the second series-resistor connected to the junction of the first series-resistor network supplying the first reference voltage, and the other terminal thereof connected to the common terminal of a 2-to-1 switch means, the first switched terminal of the switch means being connected to the system ground potential, and the second switched terminal to the maximum reference voltage, with a junction between the two resistors of the second series-resistor network supplying the second reference voltage $V_{ref_{n-2}}$

a plurality of n comparators having each of the positive inputs thereof connected to the analog input and each of the negative inputs thereof connected to a corresponding one of the n reference voltage supply circuits, and each of the outputs of the plurality of n comparators generating a corresponding digital data bit of Q_{n-1}, Q_{n-2}, . . . , Q_0 respectively;

wherein the reference voltages generated by the plurality of n reference voltage supply circuits are determined by

$$Vref_{n-1}=(\tfrac{1}{2})V_{max},$$

$$Vref_{n-2}=[Q_{n-1}(\tfrac{1}{2})+(\tfrac{1}{4})]V_{max},$$

$$Vref_0=[Q_{n-1}(\tfrac{1}{2})+Q_{n-2}(\tfrac{1}{4})+\ldots+Q_1(\tfrac{1}{2}^{n-1})+\tfrac{1}{2}^n]V_{max}$$

and the digital output bits Q_{n-1}, Q_{n-2}, . . . , Q_0 being determined as a set of n data bits representing the converted digital data of the input analog signal, wherein each of the digital output bits Q_{n-1}, Q_{n-2}, . . . , Q_0 are fed back to the reference voltage supply circuits for the determination of the output digital bits in a series of time periods.

6,040,795

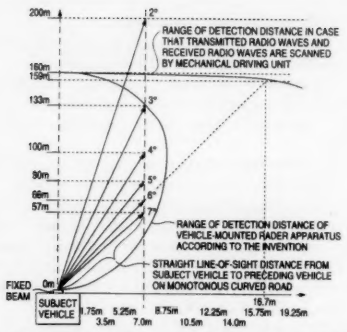
VEHICLE-MOUNTED RADAR APPARATUS

Masahiro Watanabe, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1998, Appl. No. 8,546
Claims priority, application Japan, Jul. 15, 1997, 9-189518
Int. Cl.[7] G01S *13/93*
U.S. Cl. 342—70 **2 Claims**

1. A vehicle-mounted radar apparatus for mounting on a subject vehicle comprising:

a fixed beam antenna unit for transmitting radio waves and receiving radio waves reflected by a vehicle, said antenna unit configured to have an antenna gain which is set so that a maximum detection distance for detecting objects using the vehicle-mounted radar apparatus is a straight line-of-sight distance with respect to each straight line-of-sight angle from said subject vehicle to a target vehicle traveling on a same path; and



a signal processing unit for determining a relative distance and a relative velocity of said target vehicle based on reflected radio waves received by said antenna.

6,040,796

RADAR SYSTEM INSTALLABLE IN AN AUTOMOTIVE VEHICLE FOR DETECTING A TARGET OBJECT

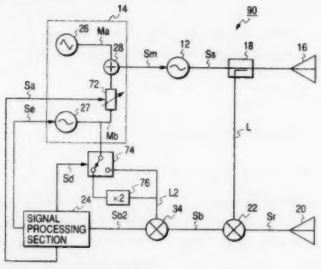
Kazuoki Matsugatani, and Masanobu Yukumatsu, both of Kariya, Japan, assignors to Denso Corporation, Kariya, Japan

Filed Mar. 17, 1998, Appl. No. 39,942

Claims priority, application Japan, Mar. 18, 1997, 9-064865; May 16, 1997, 9-127266; Aug. 29, 1997, 9-235157

Int. Cl.[7] G01S *13/93;13/42*

U.S. Cl. 342—70 **19 Claims**



1. A radar system comprising:

transmitting signal generating means for producing a high-frequency transmitting signal which is carried on a radar wave, said transmitting signal being frequency modulated in accordance with a linear modulation component and a cyclic modulation component, the transmitting signal generating means including

first component generating means for producing said linear modulation component, the linear modulation component varying a frequency of said transmitting signal linearly relative to time,

second component generating means for producing said cyclic modulation component, the cyclic modulation component varying said frequency of said transmitting signal cyclically at a cyclic frequency larger than twice a frequency of a beat signal,

adding means for adding said linear modulation component and said cyclic modulation component and producing a modulation signal, and

a high-frequency oscillator producing said high-frequency transmitting signal whose frequency is variable in accordance with said modulation signal;

a high-frequency mixer for mixing a received signal of the radar wave reflected from a target object with a local signal derived from said transmitting signal produced from said transmitting signal generating means, and producing the beat signal, the beat signal being a signal having a frequency component representing a difference between said received signal and said local signal; and

calculating means for obtaining a distance from the radar system and a velocity relative to the radar system of said target object based on harmonic components of said beat signal produced when said transmitting signal is modulated by said cyclic modulation component.

6,040,797

METHOD FOR DETECTING A RADAR TARGET

Franz-Xaver Hofele, Donzdorf, Germany, assignor to Daimler-Chrysler AG, Germany

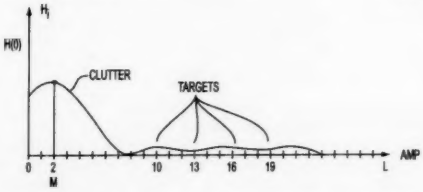
PCT No. PCT/EP98/05535, § 371 Date Jul. 20, 1999, § 102(e) Date Jul. 20, 1999, PCT Pub. No. WO99/12051, PCT Pub. Date Mar. 11, 1999

PCT Filed Sep. 1, 1998, Appl. No. 297,515

Claims priority, application Germany, Sep. 2, 1997, 197 38 252

Int. Cl.[7] G01S *13/534*

U.S. Cl. 342—159 **4 Claims**



1. A method of detecting a radar target in the presence of clutter, in which

the echo signals received by a radar system, which include both radar targets and clutter, are converted into the video range such that digitized pulse-height values are present, which correspond to the echo signals and correspond to the amplitudes of the echo signals in the video range;

the digitized pulse-height values are evaluated by means of a radar-target extractor;

a measurement window of a predeterminable size is formed in the radar-target extractor, the window corresponding to a predeterminable monitoring region having a predeterminable area;

a threshold value corresponding to the clutter is determined for the measurement window from the pulse-height values present there; and

the pulse-height values present in the measurement window are compared to the threshold value, and an echo of a radar target is recognized when a pulse-height value exceeds the threshold value, characterized in that

a frequency distribution is determined for all pulse-height values within the measurement window;

starting from the smallest present pulse-height value, having the associated frequency (H_0), the pulse-height values are added until a first predeterminable component of all of the pulse-height values present in the measurement window, the component amounting to 50% in a Gaussian distribution, is detected;

the pulse-height value (i_M) associated with this predeterminable first component is determined and established as the average value (M) of all pulse-height values within the measurement window;

the addition of the pulse-height values continues until a second predeterminable component of all of the pulse-height values present in the measurement window, the component amounting to 84% in a Gaussian distribution, is detected;

the pulse-height value (i_{M+S}) associated with this predeterminable second component is determined;

the standard deviation (S) is determined from the difference between the pulse-height value (i_{M+S}) associated with the second component and the pulse-height value (i_M) associated with the first component, according to the formula $S=i_{M+S}-i_M$;

a hit-recognition threshold TEK is determined according to the formula TEK=Function(M, S, P_{fa}), where

Function=a predeterminable function;

M=the average value of the pulse-height values;

S=the standard deviation; and

P_{fa}=a predeterminable false-alarm probability; and

within the measurement window, each pulse-height value is compared to the hit-recognition threshold TEK such that a pulse-height value larger than the hit-recognition threshold TEK is assessed as being associated with a radar target.

6,040,798

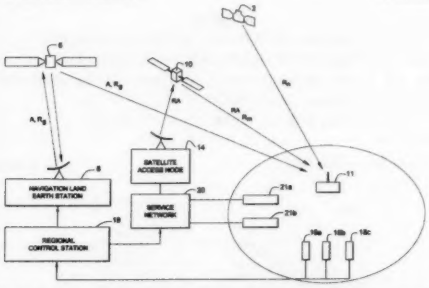
SATELLITE RADIODETERMINATION

George Vladimir Kinal, London; James Robert Nagle, II, Northwood; Claudio Soddu, Harrow, and Fintan Richard Ryan, Weybridge, all of United Kingdom, assignors to International Mobile Satellite Organization, London, United Kingdom

Filed Oct. 15, 1996, Appl. No. 730,208

Int. Cl.[7] **G01S** *5/02;* **H04B** *7/185*

U.S. Cl. 342—357.01 **9 Claims**



9. A method of satellite radiodetermination, comprising receiving at a receiver a multiple frequency ranging signal from a first satellite;

receiving at the receiver a further ranging signal from a second satellite, deriving at the receive first ionospheric delay data from said multiple frequency ranging signal; and

estimating at the receiver second ionospheric delay data for the further ranging signal on the basis of said first ionospheric delay data.

6,040,799

BEAM STEERING ANTENNA UNIT

Hiroyuki Tachihara, Inzai; Hidemichi Inoue, Inagi, and Hiroshi Endo, Tokyo, all of Japan, assignors to Harada Industry Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1998, Appl. No. 103,198

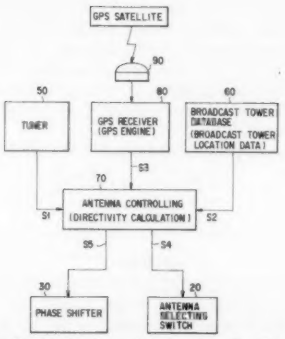
Claims priority, application Japan, Jun. 23, 1997, 9-165876

Int. Cl.[7] **G01S** *5/02;* **H04B** *7/185*

U.S. Cl. 342—357.06 **2 Claims**

1. A beam steering antenna unit comprising:

direction detection means for detecting the direction of the broadcast tower which is releasing the electric wave currently being received based on the objective broadcast station data obtainable from the tuner, broadcast tower position data obtainable from the broadcast tower data base, and the present position information obtainable from the receiver of GPS in receiving the FM or AM band, TV band, etc.;



an antenna directivity determining means for determining the directivity of the antenna based on the direction detected by the direction detecting means; and

a directivity variable operation means for varying the directivity of the antenna based on the information on the directivity of the antenna determined by the antenna directivity determining means;

said directivity variable operation means comprising:

an antenna element selecting means for selecting a plurality of antenna elements existing at specified positions out of the plural non-directivity antenna elements arrayed in a specified pitch based on the information on the directivity of antenna and combine; and

a phase relation determining means for variably determining the phase relations between the RF signals of each band received with the above antenna element selected by the antenna element selecting means based on the information on the directivity of antenna.

6,040,800

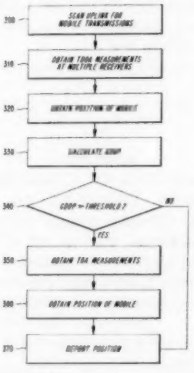
SYSTEMS AND METHODS FOR LOCATING REMOTE TERMINALS IN RADIOCOMMUNICATION SYSTEMS

Alex K. Raith, Durham; Rajaram Ramesh; Karl Molnar, both of Cary; R. David Koilpillai, Apex, and Havish Koorapaty, Raleigh, all of N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Apr. 22, 1997, Appl. No. 839,864

Int. Cl.[7] **G01S** *1/24;3/02*

U.S. Cl. 342—387 **12 Claims**



1. A method for determining a position of a remote unit communicating with a radiocommunication system comprising the steps of:

receiving, at a plurality of measurement stations, a signal transmitted by said remote unit;

forwarding, by each of said plurality of measurement stations, said received signal to a central processing center;

selecting, by said central processing center, one of a time-of-arrival (TOA) and time-difference-of-arrival (TDOA) technique for processing said received signals, wherein the TOA and the TDOA technique is selected based on a predetermined threshold; and

determining said position of said remote unit using said selected technique.

6,040,801

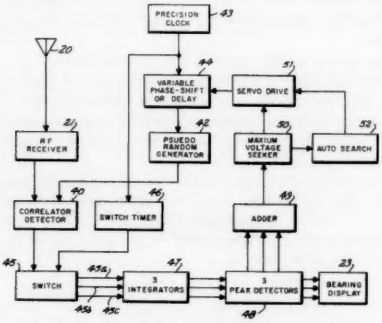
LOW DUTY CYCLE NAVIGATION SYSTEM

Willis R. Dawirs, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1964, Appl. No. 364,892

Int. Cl.[7] G01S *3/02*

U.S. Cl. 342—457 **10 Claims**



8. A mobile station of the class described comprising:

a radio receiver;

a stabilized fixed frequency clock generator of the frequency f_o;

a pseudo-random signal generator driven by said clock generator for generating a predetermined non-repetitive sequence of binary ones and zeros at said frequency of f_o;

a correlation detector coupled to said radio receiver and said signal generator for multiplying together the signals of said receiver and pseudo-random generator;

a plurality of integrator circuits;

a switch means responsive to said clock generator for successively connecting the output of said correlation detector to said integrator circuits, and

resolver means coupled to said integrators for bearing display.

6,040,802

ANTENNA CROSS-POLAR SUPPRESSION MEANS

Martin Stevens Smith, Chelmsford; Adrian David Smith, Paignton; James Edward Joseph Dalley, Harlow, and Stephen John McKenna, Torquay, all of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

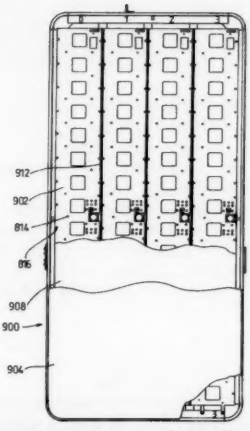
Filed May 2, 1997, Appl. No. 850,428

Claims priority, application United Kingdom, May 2, 1996, 9609265

Int. Cl.[7] H01Q *13/10*

U.S. Cl. 343—700 MS **9 Claims**

1. A linear array layered antenna assembly the antenna assembly comprising first and second apertured ground planes with an antenna assembly probe feed network printed upon a dielectric substrate supported therebetween, the probe feed network providing an array of antenna probes having different phase input feeds,



wherein an outwardly extending ground plane flange extends from one of the apertured ground planes, whereby resonant cross-polar fields are suppressed in a desired frequency of operation of the antenna.

6,040,803

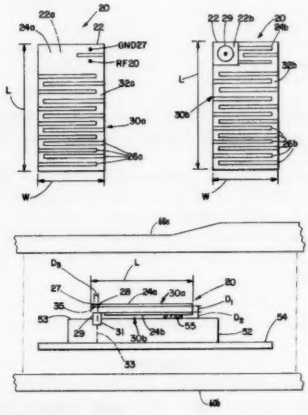
DUAL BAND DIVERSITY ANTENNA HAVING PARASITIC RADIATING ELEMENT

John M. Spall, Raleigh, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Feb. 19, 1998, Appl. No. 26,456

Int. Cl.[7] H01Q *1/38*

U.S. Cl. 343—700 MS **16 Claims**



1. An antenna, comprising:

a dielectric substrate comprising opposite first and second faces;

a first radiating element disposed on said dielectric substrate first face, said first radiating element comprising a first meandering electrically conductive path having an RF feed point and a around post;

a second radiating element disposed on said dielectric substrate second face and capacitively coupled with said first radiating element, said second radiating element comprising a second meandering electrically conductive path, wherein said first and second meandering electrically conductive paths have different lengths;

a hot feed element extending through said dielectric substrate and electrically connected to said RF feed point; and

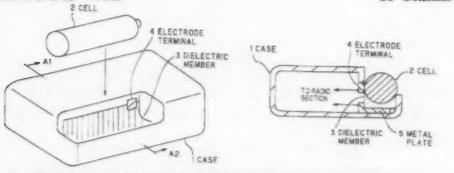
a ground feed element extending through said dielectric substrate and electrically connected to said ground post, wherein the ground feed element is not in electrical contact with the second radiating element.

6,040,804

ANTENNA UNIT FOR PORTABLE RADIO UNIT

Nobuya Harano, Shizuoka, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1998, Appl. No. 162,166
Claims priority, application Japan, Sep. 30, 1997, 9-265604
Int. Cl.[7] H01Q *1/24*
U.S. Cl. 343—702 **11 Claims**



1. An antenna unit for portable radio unit, comprising:

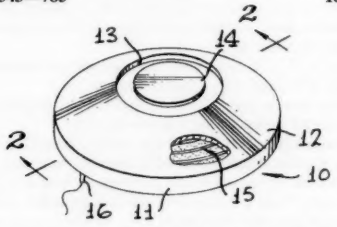
a cell with a metal covering that is disposed opposite to a conductive plate through a dielectric member.

6,040,805

LOW PROFILE CERAMIC CHOKE

Son Huy Huynh, and George Cheng, both of Torrance, Calif., assignors to Antcom Corp., Torrance, Calif.

Filed May 8, 1998, Appl. No. 75,009
Int. Cl.[7] H01Q *13/00*
U.S. Cl. 343—785 **10 Claims**



1. A low profile choke for a global positioning antenna system comprising:

a ring of high dielectric constant material having an open center and a circular peripheral edge;

a plurality of concentric segments forming said ring of high dielectric constant material providing a highly capacitive surface;

a metallized undersurface backing carried on said ring;

an antenna disposed in said open center of said ring; and

an upper surface of said ring being tapered to provide moisture runoff.

6,040,806

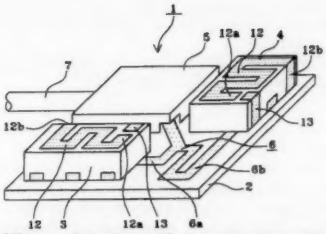
CIRCULAR-POLARIZATION ANTENNA

Yuichi Kushihi, and Masaru Shikata, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 15, 1998, Appl. No. 60,697
Claims priority, application Japan, Apr. 18, 1997, 9-101658; Dec. 19, 1997, 9-350444; Feb. 27, 1998, 10-047332
Int. Cl.[7] H01Q *1/24*
U.S. Cl. 343—853 **32 Claims**

1. A circular-polarization antenna, comprising:

a mounting substrate;



a pair of linear-polarization surface-mount antennas mounted on said mounting substrate each having a plane of polarization, the surface-mount antennas disposed such that the respective planes of polarization in a direction normal to the mounting surface of said mounting substrate are substantially perpendicular to each other;

a phase circuit connected to said pair of linear-polarization surface-mount antennas for at least one of sending thereto and receiving therefrom signals having the same amplitude and a phase difference of 90 degrees to each other;

an amplification circuit connected to said phase circuit;

a shield case covering said amplification circuit; and

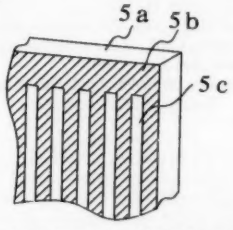
said pair of linear-polarization surface-mount antennas, said phase circuit, said amplification circuit and said shield case being mounted on the same mounting surface of said mounting substrate, said phase circuit comprising a first microstrip line having a first end and a second end, the first end being divided into a pair of second and third microstrip lines, which are connected to a pair of surface-mount antennas respectively, and the second end being connected to the amplification circuit.

6,040,807

THREE-DIMENSIONAL DISPLAY

Goro Hamagishi, Toyonaka; Keiichi Kanatani, Hirakata; Shunichi Kishimoto, Kaizuka; Masahiro Sakata, Hirakata; Atsuhiro Yamashita, Osaka; Naoki Matsushita, Hirakata, and Ken Mashitani, Nara-ken, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Continuation of application No. 08/340,392, Nov. 15, 1994, abandoned. This application Dec. 8, 1997, Appl. No. 987,140.
Claims priority, application Japan, Nov. 15, 1993, 5-284810; Apr. 27, 1994, 6-89859; Aug. 19, 1994, 6-195299
Int. Cl.[7] G09G *5/00*
U.S. Cl. 345—6 **9 Claims**



1. Three-dimensional display in which light passing through left eye pixels in a display panel and light passing through right eye pixels are emitted externally of the display panel toward an observer in a separated state, comprising:

an internal light source for emitting internal light in a plane shape;

a vertical striped filter having slits, transmitting the internal light from the internal light source, and barriers, screening the internal light emitted from the internal light source, alternately formed horizontally therein for bringing the internal light from the internal light source to a stripe shape, wherein

the barriers in said vertical striped filter are constituted by a reflector which reflects the internal light toward said internal light source; and

a display panel of a transmission type arranged on the light emission side of the vertical striped filter.

6,040,808

METHOD OF ADDRESSING A MAGNETIC MATRIX ELECTRON SOURCE FLAT PANEL DISPLAY

Andrew Knox, Kilbirnie, and John Beeteson, Skelmorlie, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

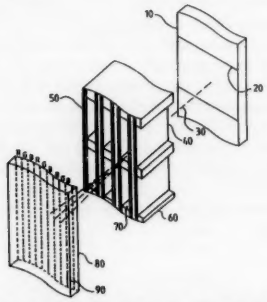
Division of application No. 08/695,856, Aug. 9, 1996. This application Oct. 22, 1997, Appl. No. 955,507.

Claims priority, application United Kingdom, Aug. 25, 1995, 9517465

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01J *29/70*

U.S. Cl. 345—13 **1 Claim**



1. A method for addressing pixels of a display screen having a plurality of pixels, each pixel having successively first, second, and third sub-pixels in line, the method comprising: generating a plurality of electron beams, each electron beam corresponding to a different one of the pixels; and, deflecting each electron beam to repetitively address the sub-pixels of the corresponding pixel in the sequence second pixel, first pixel, second pixel, third pixel.

6,040,809

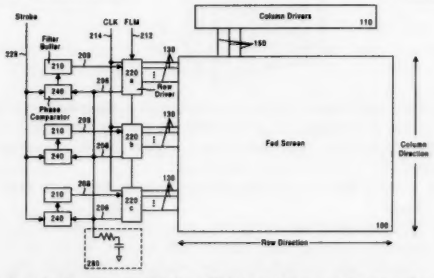
FED DISPLAY ROW DRIVER WITH CHIP-TO-CHIP SETTLING TIME MATCHING AND PHASE DETECTION CIRCUITS USED TO PREVENT UNEVEN OR NONUNIFORM BRIGHTNESS IN DISPLAY

Jay Friedman, Felton, Calif., assignor to Candescent Technologies Corporation, San Jose, Calif.

Filed Jan. 30, 1998, Appl. No. 16,829

Int. Cl.[7] G09G *3/32;5/00*

U.S. Cl. 345—74 **23 Claims**



1. A field emission display (FED) including a plurality of rows and a plurality of columns, the FED comprising:

a plurality of column drivers each coupled to provide modulated signals to the columns;

a plurality of row drivers coupled to activate and deactivate the rows one row at a time, wherein each row driver has a settling time, further wherein the row drivers are activated one at a time; and

a plurality of phase detection circuits each coupled to a respective one of the row drivers for comparing the settling time of each row driver with a pre-determined target settling time, the phase detection circuits for providing to the row drivers a phase signal representative of a time difference between the settling time and the target settling time, wherein each row driver adjusts the settling time to match the target settling time in response to the phase-signal.

6,040,810

DISPLAY DEVICE HAVING DISPLAY AND IMAGING PIXELS SANDWICHED BETWEEN SAME SUBSTRATES

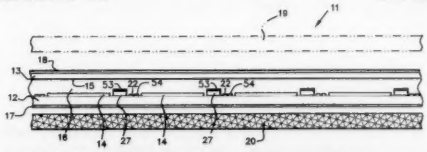
Toshio Nishimura, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 7, 1997, Appl. No. 779,529

Claims priority, application Japan, Jan. 8, 1996, 8-000775

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—87 **19 Claims**



1. A television communication apparatus comprising:

(a) a displaying/imaging apparatus disposed to face an operator comprising:

a pair of spaced apart substrates which define an internal volume therebetween, at least one of the substrates being light transmissive;

a matrix of pixel electrodes mounted on a volume-oriented side of at least one of the substrates;

at least one light-receiving element of an imaging device mounted within the internal volume;

a discrete light receiving electrode having means for adjusting the amount of light received by the light-receiving element;

a dielectric interposed within the internal volume, the dielectric providing a display function in accordance with activation of the pixel electrodes;

(b) image driving means for receiving an image signal through a communication line and providing the pixel electrodes with the image signal to perform a display operation;

(c) a speaker;

(d) an audio driving circuit for receiving an audio signal through the communication line and driving the speaker;

(e) a microphone; and

(f) transmitting means for transmitting outputs from the outputting means and the microphone to the communication line.

6,040,811

THIN DISPLAY UNIT FOR PORTABLE COMPUTERS

Satwinder D. S. Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 18, 1997, Appl. No. 877,773

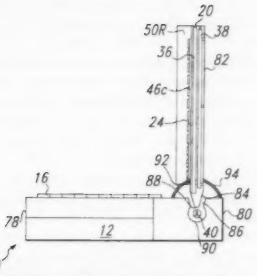
Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—87 **3 Claims**

1. An electronic device having a display unit, said device comprising:

a base member;

a visual display including a viewing surface for displaying a visual image secured to said base member, said display including:



at lease one flap attached to the at least one edge of said display, and extending outwardly from said viewing surface in a direction substantially normal to said viewing surface;

electronic components housed within said at least one flap, said electronic components electrically coupled to said visual display; and

wherein said base member includes top, bottom and side surfaces, said at least one flap extending opposite a said side surface.

6,040,812

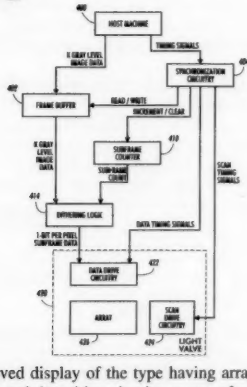
ACTIVE MATRIX DISPLAY WITH INTEGRATED DRIVE CIRCUITRY

Alan G. Lewis, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1996, Appl. No. 666,033

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—89 **20 Claims**



1. An improved display of the type having array circuitry, scan drive circuitry, and data drive circuitry at a surface of a substrate; the array circuitry including scan lines, data lines, and, for each of a set of scan line/data line pairs, cell circuitry connected to the scan line and the data line; the cell circuitry including:

an electrooptical element for controlling presentation of a part of images; and

a switching element connected to receive a scan signal provided on the scan line by the scan drive circuitry; the scan signal being periodic at a scanning frequency, with each period including a duty interval during which the switching element electrically connects the data line and a data lead of an electrical component of the electrooptical element; the data drive circuitry providing a data signal on the data line that includes, during the duty interval, a signal segment with a voltage magnitude;

the improvement comprising, in combination:

the scan drive circuitry being structured to provide the scan signals with the scanning frequency being at least K times the lesser of a maximum response frequency of the electrooptical element and a normal human viewer's maximum perceptual frequency, where K is eight or more; and

the data drive circuitry being structured to receive digital input signals from digital input leads and, in response, to provide, during each duty interval, a signal segment with either a maximum or a minimum voltage magnitude;

the electrooptical element receiving, during each duty interval, either approximately the maximum voltage magnitude or approximately the minimum voltage magnitude and presenting, through time averaging, any of K distinct, continuous gray levels without perceptible flicker.

6,040,813

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE AND A METHOD FOR DRIVING THE SAME

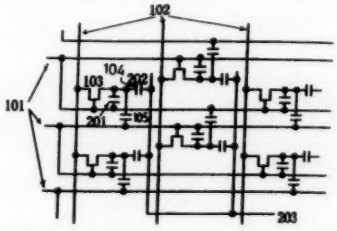
Yoneharu Takubo, Ishikawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 9, 1996, Appl. No. 762,563

Claims priority, application Japan, Dec. 12, 1995, 7-322106

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—92 **11 Claims**



1. An active matrix liquid crystal display device comprising a plurality of scanning lines and a plurality of signal lines which are disposed in a matrix to form combinations of one of said plurality of scanning lines and of one of said plurality of signal lines, said device further including a single switching element and a pixel electrode corresponding to each of said combinations of a first scanning line and a signal line; wherein said first scanning line corresponding to each of said pixel electrodes is located on both upper and lower sides of said pixel electrode, said switching element is provided on a single side of said first scanning line of each pixel, and an additive capacitance is formed between said pixel electrode and a second scanning line, said second scanning line being a scanning line other than said first scanning line in the combinations corresponding to said pixel electrode; and wherein a scanning line on which the additive capacitance is formed between said second scanning line and said pixel electrode associated with said first scanning line differs in subsequent scanning lines relative to said signal line.

6,040,814

ACTIVE-MATRIX LIQUID CRYSTAL DISPLAY AND METHOD OF DRIVING SAME

Hiroshi Murakami; Koji Yoshioka; Keizo Morita; Masafumi Itokazu; Ken-ichi Nakabayashi; Akira Yamamoto, and Munehiro Haraguchi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 13, 1996, Appl. No. 647,685

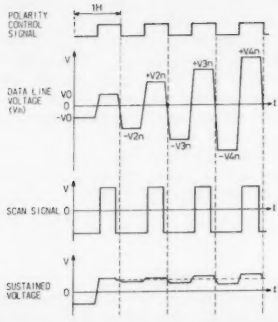
Claims priority, application Japan, Sep. 19, 1995, 7-239773

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—94 **47 Claims**

1. An active-matrix LCD comprising:

a liquid crystal panel having data lines arranged in parallel with one another, scan lines arranged orthogonally to the data lines, and liquid crystal cells arranged at the intersections of the data and scan lines, respectively, each of the cells having a cell electrode and switching means that is arranged between and



connected to the cell electrode and a corresponding one of the data lines, the conduction of the switching means being controlled in response to a scan pulse applied to a corresponding one of the scan lines;

a data driver for applying data signals to the data lines, respectively, so that the data signals are written to the corresponding ones of the cells; and

a scan driver for applying the scan pulse sequentially to the scan lines,

the data driver applying positive and negative signals that are opposite to each other with respect to a reference level, to each of the data lines within the period of the scan pulse to reduce an influence of parasitic capacitance between the cell electrode and the data lines.

6,040,815

LCD DRIVE IC WITH PIXEL INVERSION OPERATION

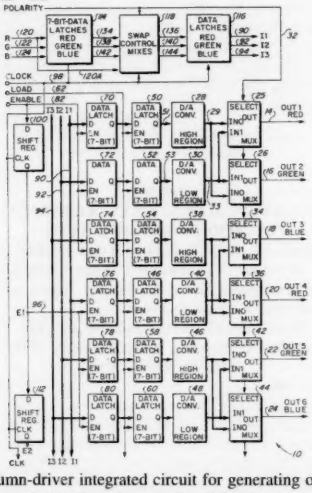
Richard Alexander Erhart, Chandler, and James Richard Kozicek, Mesa, both of Ariz., assignors to Vivid Semiconductor, Inc., Chandler, Ariz.

Continuation of application No. 08/715,788, Sep. 19, 1996, Pat. No. 5,754,156. This application Feb. 20, 1998, Appl. No. 27,513.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—98 **1 Claim**



1. A column-driver integrated circuit for generating output voltages to be applied to the columns of an LCD display, such output voltages falling within either an upper voltage range or a lower voltage range, said column-driver integrated circuit comprising in combination:

a. a first digital-to-analog converter circuit having a plurality of input terminals for receiving a first digital data word corresponding to a voltage within the upper voltage range, said first digital-to-analog converter circuit including a first analog voltage terminal for providing a first analog voltage signal within the upper voltage range;

b. a second digital-to-analog converter circuit having a plurality of input terminals for receiving a second digital data word corresponding to a voltage within the lower voltage range, said second digital-to-analog converter circuit including a second analog voltage terminal for providing a second analog voltage signal within the lower voltage range;

c. a first column output terminal for providing an analog output voltage to drive a first column within the LCD display;

d. a second column output terminal for providing an analog output voltage to drive a second column within the LCD display; and

e. analog multiplexer circuitry coupled to said first and second analog voltage terminals for receiving the first and second analog voltage signals, said analog multiplexer circuitry also being coupled to said first and second column output terminals, said analog multiplexer circuitry transmitting, during a first column driving cycle, the first analog voltage signal to said first column output terminal and the second analog voltage signal to said second column output terminal, and said analog multiplexer circuitry transmitting, during a second column driving cycle, the second analog voltage signal to said first column output terminal.

6,040,816

ACTIVE MATRIX DISPLAY DEVICE WITH PHASE-ADJUSTED SAMPLING PULSES

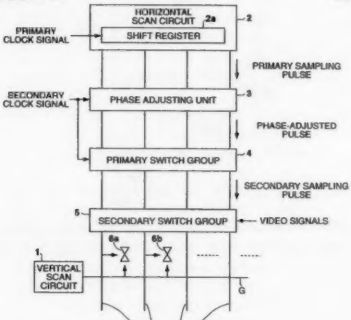
Katsuhide Uchino, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Nov. 4, 1997, Appl. No. 964,012

Claims priority, application Japan, Nov. 8, 1996, P08-296045

Int. Cl.[7] G09G *3/36*

U.S. Cl. 345—99 **16 Claims**



1. An active matrix display device including:

a pixel unit including gate lines, signal lines and pixels which are arranged at respective intersecting portions of said gate lines and said signal lines;

a vertical scan circuit for successively scanning said gate lines to select one row of pixels every horizontal period;

a horizontal scan circuit for supplying video signals to the signal lines to write the video signals in the pixels of the selected row, said horizontal scan circuit having a shift register which operates in accordance with a primary clock signal to output primary sampling pulses;

a phase adjusting unit for performing phase adjustment on the primary sampling pulses in accordance with a secondary clock signal to output phase-adjusted pulses;

a primary switch group which is connected to output stages of said phase adjusting unit and which performs a switching operation in accordance with the phase-adjusted pulses to sample the primary clock signal or the secondary clock signal and generate secondary sampling pulses; and

a secondary switch group which is connected to one end of each of said signal lines and performs a switching operation in accordance with the secondary sampling pulses to supply the video signals to said signal lines.

6,040,817

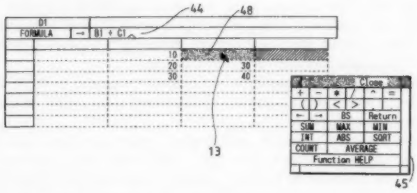
DISPLAY APPARATUS AND METHOD FOR DISPLAYING WINDOWS ON A DISPLAY

Akihiro Sumikawa, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of application No. 07/896,887, Jun. 10, 1992, abandoned, which is a continuation of application No. 07/595,802, Oct. 10, 1990, abandoned. This application Feb. 3, 1994, Appl. No. 193,356.

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—113 **11 Claims**



1. A display apparatus comprising:

a display;

means for displaying a first window containing first information and a second window containing second information on the display;

cursor means for indicating a first point on the display;

means for positioning said second window on said display at a selected horizontal distance and a selected vertical distance from said first point, said second window being movable with said first point while maintaining said selected horizontal and vertical distances from said first point when said first point is moved to other positions on the display, said second window excluding the first point.

6,040,818

METHOD AND APPARATUS FOR DISPLAYING PIXELS ON A DISPLAY DEVICE

Toshiya Minami, Sagamihara; Hiroshi Satoh, Machida, and Takanobu Satoh, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 07/879,075, May 1, 1992, abandoned, which is a continuation of application No. 07/565,598, Aug. 10, 1990, abandoned. This application Jul. 12, 1994, Appl. No. 274,133.

Claims priority, application Japan, Nov. 8, 1989, 1-207040

Int. Cl.[7] G09G *5/10*

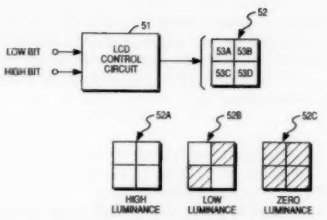
U.S. Cl. 345—147 **24 Claims**

1. A device for generating pixel luminance signals corresponding to text to be displayed comprising:

a) means for selectively generating a normal mode signal for selected first text and a high intensity mode signal for highlighting selected second text concurrently displayed with said first text;

b) means for receiving an intensity signal specifying a first mode or a second mode; and

c) means, coupled to the means for receiving, for generating background pixel luminance signals of a first luminance level



and, in the first mode, for decreasing contrast while increasing overall luminance, relative to said second mode, of said first text by generating foreground pixel luminance signals of a second luminance level with less luminance than the first luminance level and, in the second mode, for increasing contrast while decreasing overall luminance of said second text to be highlighted by generating foreground pixel luminance signals of a third luminance level with less luminance than the second luminance level, whereby said first text in the first mode and said second text in the second mode are displayed concurrently.

6,040,819

DISPLAY APPARATUS FOR REDUCING DISTORTION OF A DISPLAYED IMAGE

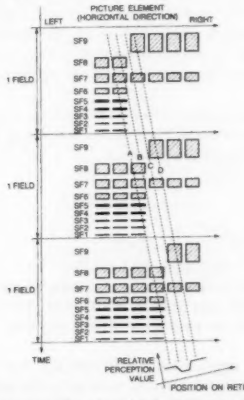
Jun Someya, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1997, Appl. No. 871,409

Claims priority, application Japan, Jun. 11, 1996, 96-149158

Int. Cl.[7] G09G *5/10*

U.S. Cl. 345—147 **25 Claims**



1. A display apparatus, in which one field is divided into a plurality of sub-fields, and a relative ratio of luminescent time of each sub-field is previously determined so that by determining a combination of luminescence and non-luminescence in respective sub-fields for a picture element, a gradation level representing by a total sum of said luminescent time in said one filed is established to provide a half-tone display, comprising:

code conversion means for converting a picture signal into a coded signal including a plurality of bits which indicate said combination of luminescence and non-luminescence in said respective sub-fields,

wherein, when a gradation level of said picture element changes from a first level in which a first display is performed by luminescence in a first sub-field which has a first relative ratio of luminescent time to a second level in which a second display is performed by luminescence in a second sub-field which has a second relative ratio of luminescent time which is greater than said first relative ratio or when said gradation

level changes from said second level to said first level, said code conversion means provides a code conversion when said gradation level is in said second level, and a third display is performed by luminescence in a third sub-field which has a third relative ratio of luminescent time which is not greater than said first relative ratio.

6,040,820

TRACK BALL INPUT DEVICE

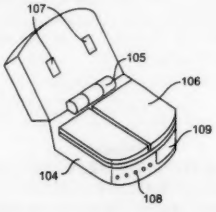
Dong Joon Choi, Daejeon, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Sep. 11, 1997, Appl. No. 927,273

Claims priority, application Rep. of Korea, Sep. 12, 1996, 96-29058

Int. Cl.[7] **G09G** *5/00*

U.S. Cl. 345—156 **8 Claims**



1. An input device used as a track ball mouse and a ball mouse, comprising:

a first housing including a ball and a track ball button;

a second housing, including a ball mouse button, the first housing hinged to the second housing to be selectively usable in a track ball position and a ball mouse position, said track ball position including a position where the first and second housings are folded upon one another, said ball mouse position including a position where the first and second housings are unfolded; and

a controlling unit sensing a rotating direction of the ball and controlling a movement of a pointer on a screen based on the rotating direction of the ball.

6,040,821

CURSOR TRACKING

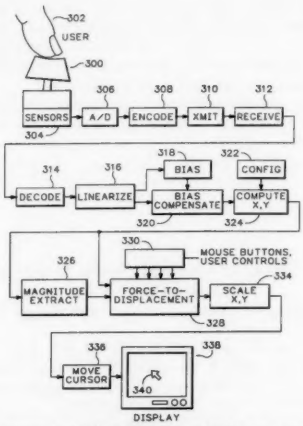
Patrick J. Franz, Portland; Philip D. Biehl, Tigard; David H. Straayer, Colton, and Robert H. Dodier, Portland, all of Oreg., assignors to InControl Solutions, Inc., Beaverton, Oreg.

Continuation of application No. 07/688,921, Apr. 19, 1991, abandoned, which is a continuation-in-part of application No. 07/649,711, Feb. 1, 1991, Pat. No. 5,189,403, which is a continuation-in-part of application No. 07/412,680, Sep. 26, 1989, Pat. No. 5,124,689, said application No. 07/688,921 is a continuation-in-part of application No. 07/557,546, Jul. 24, 1990, Pat. No. 5,231,386, said application No. 07/688,921 is a continuation-in-part of application No. 07/672,641, Mar. 18, 1991, Pat. No. 5,252,971. This application Jan. 19, 1993, Appl. No. 6,139.

Int. Cl.[7] **G09G** *5/08*

U.S. Cl. 345—159 **27 Claims**

1. In an integrated keyboard coupled to a display having a cursor, the keyboard having an array of typing keyswitches that includes a multi-purpose pointing key and a plurality of force sensors coupled to the pointing key, each force sensor having an associated direction and the force sensors providing sensor signals having a non-inear relationship to force applied to the force sensors, a method of acquiring pointing signals for repositioning the cursor comprising the steps of:



providing means in the keyboard for selecting one at a time of a typing mode of operation for acquiring typing signals and a pointing mode of operation for acquiring pointing signals;

when the keyboard is not in pointing mode, periodically scanning each of the force sensors to acquire a corresponding force signal defining a sensor bias signal;

during a pointing operation, periodically scanning each of the force sensors to acquire a corresponding force signal defining a pointing signal;

linearizing the acquired sensor bias signals and the acquired pointing signals so that the linearized signals have a generally linear relationship to force applied to the sensors at the time said signals were acquired;

deducting each linearized force sensor bias signal from the corresponding linearized pointing signal to form respective net pointing signals;

combining the net pointing signals according to the associated directions of the corresponding force sensors; and

repositioning the cursor responsive to the combined net pointing signals.

6,040,822

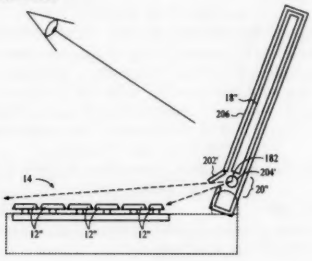
ILLUMINATED KEYBOARD SYSTEM

Mark R. Decker, 2245 Palmer Dr., St. Helena, Calif. 94574

Continuation-in-part of application No. 08/502,913, Jul. 17, 1995, Pat. No. 5,684,513. This application Oct. 29, 1997, Appl. No. 959,674.

Int. Cl.[7] **G09G** *5/00;3/36;* **H03K** *17/94*

U.S. Cl. 345—168 **15 Claims**



1. In a device which includes at least one key pad and a panel for displaying information responsive to the pressing of at least one keypad, an illuminated keypad system comprising

a light source within the panel for illuminating the panel,

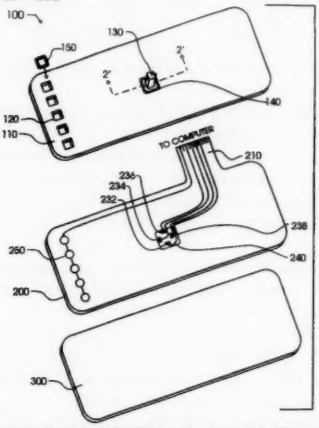
a window for allowing a portion of the light from the light source to illuminate at least one keypad.

6,040,823

COMPUTER KEYBOARD HAVING TOP MOLDED HOUSING WITH RIGID POINTING STICK INTEGRAL AND NORMAL TO FRONT SURFACE OF HOUSING AS ONE UNIT PART TO BE USED WITH STRAIN SENSORS IN NAVIGATIONAL CONTROL

Lewis L. Seffernick, Adams, and David L. Poole, Portland, both of Ind., assignors to CTS, Elkhatt, Ind.

Filed Dec. 2, 1997, Appl. No. 982,619
Int. Cl.[7] G09G *5/00;5/08;* **H03K** *17/94*
U.S. Cl. 345—168 **15 Claims**



1. A computer keyboard having a plastic molded housing having a first major surface through which keys pass to a wiring layer to control electrical connection and further having a backing plate for structural support and protection, wherein the improvement comprises in further combination a rigid projection extending normal to said first major surface between said keys;

a strain sensor adhered to said molded housing adjacent said rigid projection; and

a force concentrator formed within said plastic molded housing adjacent said rigid projection;

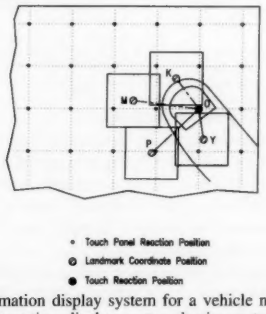
wherein said rigid projection, force concentrator and housing are all formed during a single molding process as an integral unit.

6,040,824

INFORMATION DISPLAY SYSTEM WITH TOUCH PANEL

Kazuteru Maekawa; Yukiyoshi Suzuki, and Takeshi Yanagikubo, all of Anjo, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Jun. 30, 1997, Appl. No. 885,138
Claims priority, application Japan, Jul. 31, 1996, 8-201982
Int. Cl.[7] G09G *5/00*
U.S. Cl. 345—173 **15 Claims**



1. An information display system for a vehicle navigation system, said information display system having a touch panel for selecting an item by touching the selected item among a plurality of items displayed on a single display screen, comprising

storing means for storing display data for displaying the plurality of items including one set of typical coordinates indicating a position for each of the items;

said plurality of items displayed on the display screen being marks displayed on a map so that the coordinates of the displayed items are the locations of the marks on the map;

calculation means for calculating coordinate differences between the typical coordinates for each of the plurality of displayed items and a set of coordinates of a position of a single touch;

select means for selecting the selected item by determining which item of the plurality of displayed items has the least calculated coordinate difference;

deciding means for deciding whether or not a present touch is being made to correct an erroneous selection made from a previous touch; and

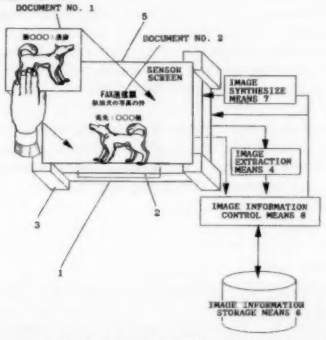
probability reducing means, responsive to a decision that the present touch is being made to correct an erroneous selection, for reducing a probability of said select means selecting the previously selected item.

6,040,825

INPUT/DISPLAY INTEGRATED INFORMATION PROCESSING DEVICE

Hiroshi Yamamoto, Katano; Yasuharu Shimeki, Suita; Kazuhiro Kayashima, Hirakata; Susumu Maruno, Osaka; Makoto Fujimoto, Ibaraki, and Yoshihiro Kojima, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of application No. 08/337,372, Nov. 8, 1994, Pat. No. 5,742,279. This application Sep. 30, 1997, Appl. No. 941,299.
Claims priority, application Japan, Nov. 8, 1993, 5-278617; Apr. 12, 1994, 6-073201; Jul. 29, 1994, 6-178079; Aug. 3, 1994, 6-182288; Aug. 12, 1994, 6-190465
Int. Cl.[7] G09G *5/00*
U.S. Cl. 345—173 **5 Claims**



1. An input/display integrated information processing device, comprising:

image display means for displaying image information;

image input means for inputting two-dimensional image information from an item having a two-dimensional image when the item is placed upon said image input means, the two dimensional image having been present on the item prior to placing the item on said input means;

a visual coincidence structure for integrally combining a display screen of said image display means with an input screen of said image input means so as to establish visual coincidence of said screens as viewed by an user;

image extraction means for extracting a portion of the two-dimensional image information on said image input means;

image information storage means for storing two-dimensional image information extracted by said image extraction means; and

image information control means for controlling input/output operations of the two-dimensional image information;

wherein said image input means scans in the two-dimensional image information; and

wherein said image extraction means includes object image extraction means for extracting only image information in a portion corresponding to a surface of the item placed upon the image input means from the two-dimensional image information scanned by the image input means.

6,040,826

DRIVING CIRCUIT FOR DRIVING SIMPLE MATRIX TYPE DISPLAY APPARATUS

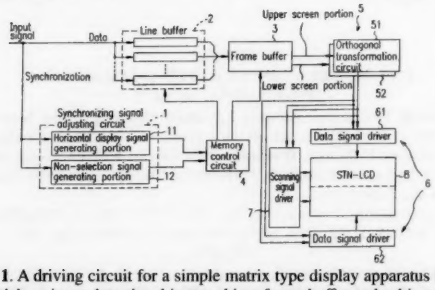
Hiroyuki Furukawa, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1997, Appl. No. 958,213

Claims priority, application Japan, Oct. 30, 1996, 8-288855

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—196 **8 Claims**



1. A driving circuit for a simple matrix type display apparatus in which an input data signal is stored in a frame buffer and subjected to orthogonal transformation, said driving circuit comprising:

a plurality of line buffers having a number equal to a number of selected scanning lines selected in accordance with a multiple-scanning line simultaneous selection method, each of said plurality of line buffers having a first region and a second region, wherein while one of the first and second regions is used for writing, the other region is used for reading; and

a frame buffer which enables data from the plurality of line buffers to be written during a plurality of horizontal non-display periods and enables all of the selected scanning lines of data to be written at a same time, wherein the number of the selected scanning lines is equal to the number of the plurality of horizontal non-display periods.

6,040,827

DRIVER CIRCUIT, DRIVER INTEGRATED CIRCUIT, AND DISPLAY DEVICE AND ELECTRONIC DEVICE USING THE DRIVER CIRCUIT AND DRIVER INTEGRATED CIRCUIT

Kazuhiro Shiina; Koji Kawamoto; Masato Miura, all of Hitachi; Hitoshi Ohura, Mito; Shoichi Ozeki, Hitachi; Noboru Akiyama, Hitachinaka; Kunihoro Nunomura, Hitachi; Minehiro Nemoto, Hitachi, and Masahiro Iwamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Haramachi Electronics Co., Ltd., Ibaraki, both of Japan

Filed Jul. 10, 1997, Appl. No. 890,994

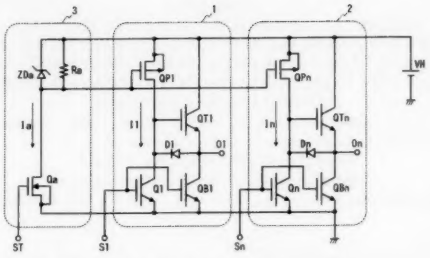
Claims priority, application Japan, Jul. 11, 1996, 8-181870; Aug. 22, 1996, 8-220993

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—208 **9 Claims**

1. A driver circuit comprising a first switching element and a second switching element which are totem-pole-connected,

wherein said totem pole connection is connected at its one end, a node and its other end to a power source, an output to a load and a reference potential, respectively,



wherein said first switching element is connected between said one end and said node,

wherein said second switching element is connected between said node and said other end,

wherein a circuit including a third switching element is connected between the one end of said totem pole connection and the control terminal of said first switching element, the third switching element having a control terminal for a control signal,

wherein a fourth switching element is connected between the control terminal of said first switching element and the other end of said totem pole connection,

wherein said second and fourth switching elements have a common control terminal for another control signal, and

wherein a diode is connected between the control terminal of said first switching element and said node.

6,040,828

LIQUID CRYSTAL DISPLAY

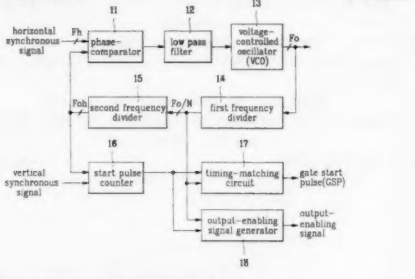
Ki Pan Park, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed May 15, 1997, Appl. No. 856,576

Claims priority, application Rep. of Korea, May 15, 1996, 96-16137

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—213 **8 Claims**



1. A liquid display device comprising:

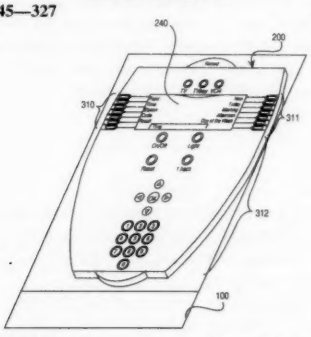
a frequency division circuit for receiving a horizontal synchronous signal Fh and for providing a signal Fo/N and a signal Foh, said Fo/N signal having a frequency equal to at least twice the frequency of said horizontal synchronous signal Fh, and said signal Foh having a frequency equal to approximately said signal Fh; and

a gate driver circuit for receiving said signal Fo/N as a clock thereof and for producing at least two gate line pulses per one period of said signal Fh.

6,040,829
PERSONAL NAVIGATOR SYSTEM

Clemens Croy, Staufenstrasse 39, 60323 Frankfurt am Main, and Rainer F.R. Bermbach, Billrothstrasse 7, D-38302 Wolfenbüttel, both of Germany

Filed May 13, 1998, Appl. No. 78,604
Int. Cl.[7] G06F *3/00*
U.S. Cl. 345—327 **40 Claims**



1. A control device for monitoring and controlling an electronic device, comprising:

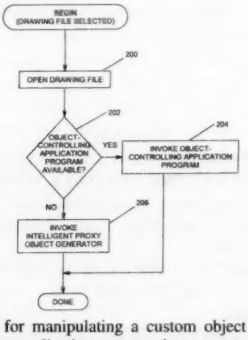
a display component for displaying a dual partition selection list, the dual partition selection list having a first selection list and a second selection list, at least a portion of the first selection list and at least a portion of the second selection list being at least partly concurrently displayable on the display component; and

a selection component for selecting elements from the dual partition selection list, the selection component having a first selection component for selecting elements from the first selection list, a selection made from the first selection list using the first selection component causing a display of corresponding items in the second selection list while the first selection list is at least partly concurrently displayed, a selection made from the second selection list using the second selection component causing a display of corresponding items in the first selection list while the second selection list is at least partly concurrently displayed.

6,040,830
INTELLIGENT PROXY OBJECTS

Keshaba Chandra Sahoo, San Rafael, Calif., assignor to Autodesk, Inc., San Rafael, Calif.

Filed Jun. 20, 1997, Appl. No. 880,184
Int. Cl.[7] G06F *15/00;9/44*
U.S. Cl. 345—335 **27 Claims**



1. A method for manipulating a custom object created by an object-controlling application program in a parent application program executed by an object-oriented computer system, comprising the steps of:

receiving an indication that the custom object is to be manipulated;

attempting to load the object-controlling application program that created the custom object from the parent application program, so that the object-controlling application is available to manipulate the custom object;

determining in the parent application program that the object-controlling application program is not available to manipulate the custom object;

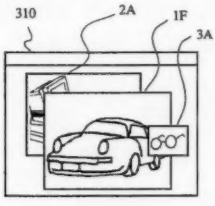
creating an intelligent proxy object in the parent application program as a surrogate for the custom object when it is determined that the object-controlling application program is not available; and

manipulating the intelligent proxy object rather than the custom object using messages sent to the intelligent proxy object, wherein the object-controlling application program defines the messages to which the intelligent proxy object can respond when the object-controlling application program is not available.

6,040,831
APPARATUS FOR SPACIALLY CHANGING SOUND WITH DISPLAY LOCATION AND WINDOW SIZE

Shinsuke Nishida, Tokyo, Japan, assignor to Fourie Inc., Tokyo, Japan

PCT No. PCT/JP96/01832, § 371 Date Feb. 21, 1997, § 102(e) Date Feb. 21, 1997, PCT Pub. No. WO97/03433, PCT Pub. Date Jan. 30, 1997
PCT Filed Jul. 1, 1996, Appl. No. 793,625
Claims priority, application Japan, Jul. 13, 1995, 7-200351
Int. Cl.[7] G06F *3/14*
U.S. Cl. 345—340 **3 Claims**



1. An apparatus for presenting a picture along with sound comprising:

a display for displaying pictures;

a speaker for producing sounds;

data supply means for supplying plural sets of presentation information, each set of presentation information including picture data for allowing the display to display a picture and sound data for allowing the speaker to produce sound;

input means for inputting respective designated positions and respective designated sizes for respective picture data; and

control means for controlling the display so that pictures are displayed based on picture data supplied from the data supply means and for controlling the speaker so that sounds are produced based on sound data supplied from the data supply means;

said control means having;

a first function to adjust respective magnifications of the picture data so that pictures are displayed in respective display areas having said respective designated sizes;

a second function to display individual pictures in said respective display areas located at said respective designated positions on a screen on the basis of adjusted picture data, a part of a picture being concealed by other pictures when they are overlapped;

a third function to determine actual display areas which are not concealed on the screen for said individual pictures; and

a fourth function to adjust volumes of the sound data so that sounds related to said individual pictures are respectively

produced with volumes corresponding to said actual display areas of said individual pictures.

6,040,832

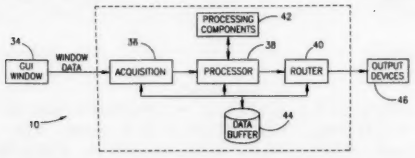
APPARATUS FOR AND METHOD OF ACQUIRING, PROCESSING AND ROUTING DATA CONTAINED IN A GUI WINDOW

Illan Poreh, Havazelet-Hasharon; Avner Algom, Tel Aviv; Alexander Vaindiner, Or Akiva, and Ilya Shpilberg, Netanya, all of Israel, assignors to AnySoft Ltd., Herzlia, Israel

Division of application No. 08/540,530, Oct. 10, 1995. This application Aug. 10, 1998, Appl. No. 132,163.

Int. Cl.[7] G06F *17/00*

U.S. Cl. 345—340 **26 Claims**



1. A graphical user interface window data processing system comprising:

acquisition means associated with a first application program for capturing data in a standard graphical user interface format from a graphical user interface window associated with a second application program, wherein at least a portion of said format comprises a text format, said acquisition means storing said data in said standard graphical user interface format in a data buffer;

a processor for processing said data stored in said data buffer; and

a router for transmitting said data processed by said processor to at least one output device.

6,040,833

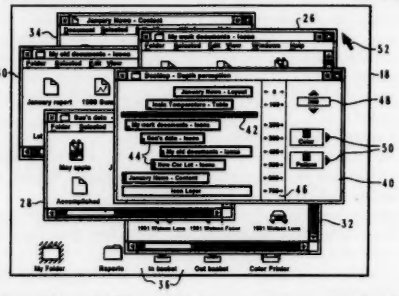
METHOD AND SYSTEM FOR DISPLAY MANIPULATION OF MULTIPLE APPLICATIONS IN A DATA PROCESSING SYSTEM

Susan F. Henshaw, Cary, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 10, 1993, Appl. No. 165,430

Int. Cl.[7] G06F *3/14*

U.S. Cl. 345—344 **21 Claims**



1. A graphic method for permitting access to any one of multiple windows displayed in a graphical user interface and which are relatively positioned in an order from a bottom position to a top position, said method comprising the steps of:

displaying a depth control object within said graphical user interface, said depth control object including a plurality of graphic elements arranged in said order, each of said plurality of graphic elements corresponding to one of said windows; and

altering said display of said windows within said graphical user interface in response to a selection by a user of a particular one of said graphic elements within said depth control object to display a selected window corresponding to said particular one of said graphic elements and each window relatively positioned beneath said selected window.

6,040,834

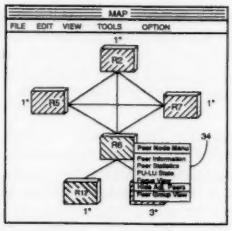
CUSTOMIZABLE USER INTERFACE FOR NETWORK NAVIGATION AND MANAGEMENT

Sunil Jain, and Robert Williams, both of Cary, N.C., assignors to Cisco Technology, Inc., San Jose, Calif.

Filed Dec. 31, 1996, Appl. No. 775,289

Int. Cl.[7] G06F *3/14;15/177*

U.S. Cl. 345—356 **31 Claims**



1. A graphical user interface for network management comprising:

a repository of information pertaining to components which form a computer network and connections to those components;

means for receiving a user selection of two or more of the components, which comprise less than all of the components whose information is stored in said repository; and

means responsive to a user selection for displaying a topological map of the computer network comprising (a) only the selected components, (b) logical connections between the selected components, and (c) an indicator which identifies a relationship between each selected component and non-displayed components which are logically connected to the selected components.

6,040,835

SYSTEM FOR DEPICTING SURFACES USING VOLUMETRIC DISTANCE MAPS

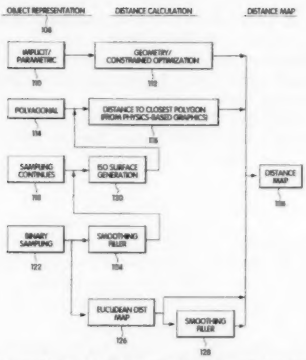
Sarah F. Gibson, Arlington, Mass., assignor to Mitsubishi Electric Information Technology Center America, Inl. (ITA), Cambridge, Mass.

Filed Nov. 6, 1997, Appl. No. 965,569

Int. Cl.[7] G06T *15/00*

U.S. Cl. 345—424 **8 Claims**

1. In a volumetric data representation system for graphical objects in which graphical objects are generated from volumetric data elements,



means for encoding the distance of a volumetric data element to the nearest object surface point; and,

means responsive to the distance of said volumetric data element to the nearest object surface point for estimating a surface normal thereof.

6,040,836

MODELLING METHOD, MODELLING SYSTEM, AND COMPUTER MEMORY PRODUCT OF THE SAME

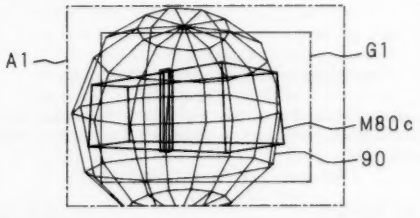
Shuichi Shiitani, and Masaki Watanabe, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 30, 1996, Appl. No. 640,438

Claims priority, application Japan, Sep. 29, 1995, 7-253056

Int. Cl.[7] G06T *15/10*

U.S. Cl. 345—427 **21 Claims**



1. A modelling method for creating a three-dimensional model of an object in a screen, comprising the steps of:

positioning a two-dimensional image within a virtual three-dimensional space, the two-dimensional image corresponding to a real three-dimensional object;

dividing said two-dimensional image into plural portions;

positioning first and second existing models within a virtual three-dimensional space, the first and the second existing models corresponding to one and the other of said portions of said two-dimensional image;

creating a first partial model and a second partial model by correcting said first and said second existing models so that a projection image of each of said first and said second existing models accords with each of said portions of said two-dimensional image; and

combining said first partial model and said second partial model so that projection images of said first partial model and said second partial model accord with the two-dimensional image of said real three-dimensional object.

6,040,837

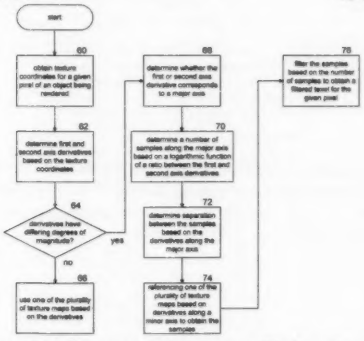
METHOD AND APPARATUS FOR SPACE VARIABLE TEXTURE FILTERING

Daniel Wong, North York, and Milivoje Aleksic, Richmond Hill, both of Canada, assignors to ATI Technologies, Inc., Thornhill, Canada

Filed Apr. 22, 1998, Appl. No. 64,630

Int. Cl.[7] G06T *17/00*

U.S. Cl. 345—430 **42 Claims**


start
60
obtain texture coordinates for a given pixel of an object being rendered
62
determine first and second axis derivatives based on the texture coordinates
64
derivatives have differing degrees of magnitude?
yes
no
66
use one of the plurality of texture maps based on the derivatives
68
determine whether the first or second axis derivative corresponds to a major axis
70
determine a number of samples along the major axis based on a logarithmic function of a ratio between the first and second axis derivatives
72
determine separation between the samples based on the derivatives along the major axis
74
referencing one of the plurality of texture maps based on derivatives along a minor axis to obtain the samples
76
filter the samples based on the number of samples to obtain a filtered texel for the given pixel

1. A method for space variant texture filtering, the method comprises the steps of:

a) obtaining texture coordinates for a given pixel of an object being rendered;

b) determining a first axis derivative and a second axis derivative based on the texture coordinates;

c) when the first and second axis derivatives have differing degrees of magnitude, determining whether the first axis derivative or the second axis derivative corresponds to a major axis;

d) determining a number of samples along the major axis based on a logarithmic function of a ratio between the first and second axis derivatives;

e) determining separation between the samples based on derivatives along the major axis;

f) referencing one of a plurality of related texture maps based on derivatives along a minor axis to obtain the samples; and

g) filtering the samples based on the number of samples to obtain a filtered texel for the given pixel.

6,040,838

GRAPHIC STATE PROCESSING

Richard D. Webb, Sunnyvale, and Ryoji Watanabe, Cupertino, both of Calif., assignors to Obejct Technology Licensing Corporation, Cupertino, Calif.

Filed Nov. 5, 1993, Appl. No. 148,052

Int. Cl.[7] G06F *15/00*

U.S. Cl. 345—433 **47 Claims**

1. An apparatus for drawing a plurality of graphic images on a graphic device, the apparatus comprising:

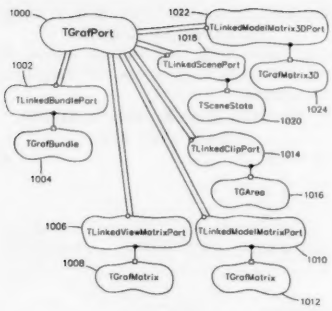
(a) processor means;

(b) storage means attached to the processor means;

(c) a graphic device under the control of the processor means;

(d) a plurality of graphic objects in the storage means, the plurality of graphic objects being arranged in a hierarchy, each graphic object comprising data and a member function for drawing an associated one of the plurality of graphic images on the graphic device means;

(e) a graphic state object in the storage means associated with each graphic object, the graphic state object containing data needed to draw the associated one graphic image; and



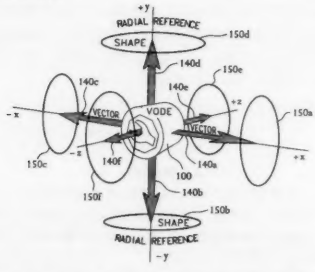
(f) application means for arranging the graphic state objects into a sequence and for processing the sequence of graphic state objects to draw one of the plurality of graphic images on the graphic device.

6,040,839

REFERENCING SYSTEM AND METHOD FOR THREE-DIMENSIONAL OBJECTS DISPLAYED ON A COMPUTER GENERATED DISPLAY

Benjamin J. Van Eldik, 16 Mattingley Court, and Martin Coffey, 22 Mattingley Court, both of Banks ACT 2906, Australia

Filed Jan. 31, 1997, Appl. No. 792,502
Int. Cl.[7] G06T *17/40*
U.S. Cl. 345—433 **30 Claims**



1. A referencing system for determining relative distances and locations of three-dimensional objects in an object field that can be displayed on a computer generated display, to enable the objects to be connected or otherwise manipulated relative to one another, comprising:

a) one or more reference points for objects found on the object field; and

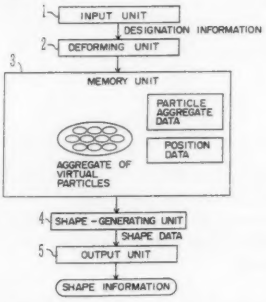
b) a referencing shape projecting subsystem for projecting from a reference point, upon activation of that reference point, one or more referencing shapes that extend along vectors radiating from the reference point, which referencing shapes extend to other positions of the object field, such referencing shapes thereby indicating relationships between objects in the object field.

6,040,840

VIRTUAL CLAY SYSTEM AND ITS METHOD OF SIMULATION

Takeshi Koshiba; Masahiro Matsuoka, and Kuniharu Takayama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 27, 1998, Appl. No. 31,916
Claims priority, application Japan, May 28, 1997, 9-137359
Int. Cl.[7] G06F *15/00*
U.S. Cl. 345—441 **17 Claims**



1. A virtual clay system utilizing a computer, comprising:

memory means for storing particle aggregate data representing an aggregate of virtual particles and position data representing a position of each particle in the aggregate;

shape-generating means for generating shape data representing a shape of the aggregate;

input means for inputting designation information on the aggregate from a user;

deforming means for dynamically changing the shape of the aggregate by modifying a position of at least some of the particles in the aggregate according to the designation information; and

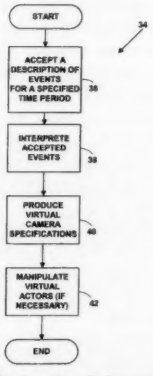
output means for outputting shape information based on the shape data.

6,040,841

METHOD AND SYSTEM FOR VIRTUAL CINEMATOGRAPHY

Michael F. Cohen; Li-wei He, and David H. Salesin, all of Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Aug. 2, 1996, Appl. No. 691,996
Int. Cl.[7] G06T *15/70*
U.S. Cl. 345—473 **31 Claims**



1. A method for displaying virtual cinematography on a display, the method comprising:

receiving cinematographic events in real time using a real-time application module;

interpreting the received cinematographic events in real time using cinematographic logic; and

automatically producing a camera view specification from the interpreted cinematographic events, where the camera specification is used to view a virtual scene on the display.

6,040,842

PROCESS CONTROL WITH EVALUATION OF STORED REFERENTIAL EXPRESSIONS IN A MULTI-AGENT SYSTEM ADAPTED FOR USE WITH VIRTUAL ACTORS WHICH ARE DIRECTED BY SEQUENTIALLY ENABLED SCRIPT AGENTS

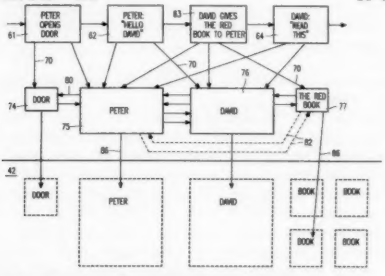
Peter R. Wavish, West Hoathly, and David M. Connah, Reigate, both of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1997, Appl. No. 840,366

Claims priority, application United Kingdom, May 2, 1996, 9609197

Int. Cl.[7] G06T *13/00;15/70;* **G06F** *15/18*

U.S. Cl. 345—473 **16 Claims**



14. A process control apparatus comprising:

a rule-based data processing apparatus comprising:

a processor coupled with first and second memory means, said first memory means having stored therein first and second groups of agents, each group of agents being defined by respective sets of rules, said processor being arranged to run said respective sets of rules in parallel, and said second memory means having stored therein data defining a plurality of objects, at least some of the data having a respective qualifier term associated therewith,

the agents of the first group being script agents and being arranged as a sequentially enabled chain, one or more of said script agents including a respective reference to one of said objects and a specified qualifier term,

each of the agents of the second group being object agents and being operable to identify an object and specified qualifier term from a script agent, to identify an instance or each instance of said object in the second memory means, to compare the specified qualifier term with the respective associated qualifier term of each identified object and, when a match occurs, to generate an identifying pointer for the identified and matched object, and

said first memory means has stored therein a group of agents being operator agent, each said operator agent being arranged to execute a selected one of two or more procedural steps, said selected one being made within the operator agent based on one or more external factors; and

external interface means coupled with the processor of said rule-based data processing apparatus, said external interface means being configured to control a plurality of external processes linked thereto on triggering of respective operator agents.

6,040,843

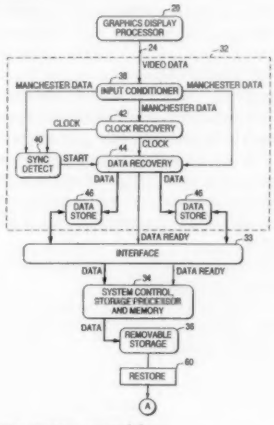
SYSTEM FOR TRANSMISSION AND RECOVERY OF DIGITAL DATA USING VIDEO GRAPHICS DISPLAY PROCESSOR AND METHOD OF OPERATION THEREOF

John W. Monroe, Flint Hill; John J. Smith, Manassas; Stephen C. Kenyon, Fairfax, and Michael E. Anderson, Herndon, all of Va., assignors to Sparta, Inc., Mclean, Va.

Continuation of application No. 08/545,508, Oct. 19, 1995, Pat. No. 5,835,102. This application Oct. 29, 1998, Appl. No. 181,850.

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—507 **27 Claims**



1. A computer system comprising:

a computer system memory which stores digital data;

a video monitor which displays information;

a graphics display processor, coupled to the computer system memory, which processes the digital data stored in the computer system memory to produce at least one data stream including the digital data and which outputs information to be displayed by the video monitor;

a video channel, coupling the video monitor to the graphics display processor, which outputs the information to be displayed to the video monitor and which outputs the at least one data stream including the digital data; and

a system, coupled to the video channel, which processes the at least one data stream including the digital data outputted from the video channel.

6,040,844

APPARATUS AND METHOD FOR STORING AND ACCESSING PICTURE GENERATION DATA

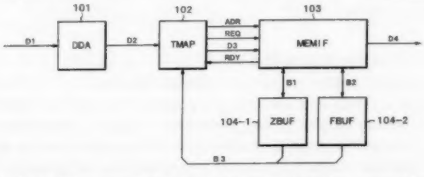
Yuji Yamaguchi; Masaharu Yoshimori; Hiroyuki Ozawa; Ryohei Iida, all of Tokyo, and Kazuo Taniguchi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1997, Appl. No. 899,925

Claims priority, application Japan, Jul. 31, 1996, 8-217774

Int. Cl.[7] G06F *12/06*

U.S. Cl. 345—518 **28 Claims**



1. In a picture generating system, the combination comprising:

a display;

a memory subsystem for storing picture generation data, said memory subsystem having an addressable main memory and an addressable auxiliary memory, said main memory storing picture generation data, said auxiliary memory responsive to said main memory for receiving picture generation data therefrom and for temporarily storing said received picture generation data;

a read/write port for accessing said main memory;

a dedicated read only port for accessing said auxiliary memory;

means for reading/writing certain selected portions of said picture generation data through said read/write port;

means for reading other selected portions of said picture generation data through said dedicated read only port when said other selected portions of said picture generation data are present in said auxiliary memory;

means for transferring said other selected portions of said picture generation data from said main memory to said auxiliary memory when said other selected portions of said picture generation data are not present in said auxiliary memory; and

means for processing said certain selected portions of said picture generation data and said other selected portions of said picture generation data to generate picture data for forwarding to said display;

wherein said reading/writing means, reading means and transferring means operate in parallel;

wherein said certain selected portions of said picture generation data and said other selected portions of said picture generation data are mutually exclusive.

6,040,845

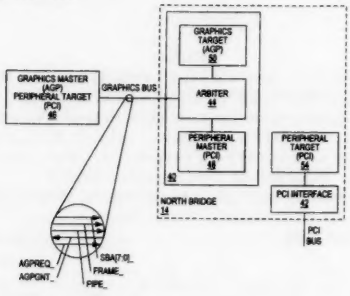
DEVICE AND METHOD FOR REDUCING POWER CONSUMPTION WITHIN AN ACCELERATED GRAPHICS PORT TARGET

Maria L. Melo, Houston, and Gregory N. Santos, Cypress, both of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Dec. 22, 1997, Appl. No. 995,763

Int. Cl.[7] G06F *13/14*

U.S. Cl. 345—520 **17 Claims**



1. A computer, comprising:

a graphics master coupled to a graphics bus; and

a bus interface unit comprising a graphics target and an arbiter operably coupled to the graphics bus, wherein said arbiter is adapted for granting mastership of the graphics bus to the graphics master only during a first time period in which a power supply and a clocking signal are selectively connected to said graphics target.

6,040,846

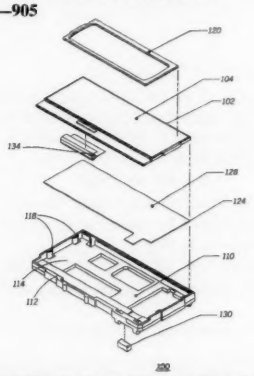
IMPACT RESISTANT DISPLAY APPARATUS

Stephen Millard Stanton; James Talmage Davis, II; Alan James Dutson, all of Fort Worth, and Gregory Lane Henderson, Watauga, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 16, 1998, Appl. No. 24,040

Int. Cl.[7] G09G *5/00*

U.S. Cl. 345—905 **12 Claims**



1. A display apparatus having improved mechanical integrity, the display apparatus comprising:

a display; and

a support bezel, mechanically coupled to the display, the support bezel comprising:

peripheral walls forming an aperture for containing the display, the peripheral walls comprising an extended portion extending beyond a viewable surface of the display in a direction perpendicular to the viewable surface; and

a plurality of cantilevered clips integral to the extended portion of the peripheral walls and comprised of the same material as the support bezel for holding the display in the aperture, the plurality of cantilevered clips projecting towards the display in a direction parallel to the viewable surface and touching the viewable surface,

wherein the support bezel is a one-piece molded member of the display apparatus.

6,040,847

METHOD OF RECORDING IMAGES AND AN IMAGE-FORMING DEVICE FOR APPLICATION OF THE METHOD

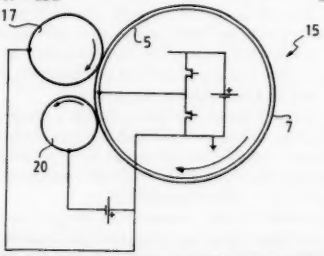
Mike Paul van Eekhout; Pierre Antonius Marie Klerken, and Robertus Petrus Cornelis Quirijnen, all of Venlo, Netherlands, assignors to OCE-Nederland B.V., Ma Venlo, Niger

Filed Dec. 20, 1995, Appl. No. 575,617

Claims priority, application Netherlands, Dec. 23, 1994, 9402196

Int. Cl.[7] B41J *2/39;2/395;2/40;2/06*

U.S. Cl. 347—151 **13 Claims**



1. A method of recording images on an image-recording medium and having a dielectric surface, which method comprises the step of applying, in accordance with an image pattern to be recorded, a

voltage between a set of image-recording electrodes and a companion electrode, either one of the set of image-recording electrodes and the companion electrode being situated beneath the dielectric surface and an other one of the set of image-recording electrodes and the companion electrode being situated a distance above the dielectric surface, the applied voltage causing toner powder situated in the space between the dielectric surface and the electrode disposed thereabove, to be deposited onto the dielectric surface in accordance with the image pattern to be recorded, wherein the improvement comprises the steps of:

(a) applying a first voltage of a first orientation between the image-recording electrodes and the companion electrode to effect image recording; and then

(b) applying a second voltage of a second orientation opposite and substantially equal to said first voltage of said first orientation between the image-recording electrodes and the companion electrode, wherein the second voltage is of opposite orientation relative to the first voltage.

6,040,848

INFORMATION RECORDING APPARATUS AND METHOD OF RECORDING INFORMATION BY APPLYING VOLTAGE BETWEEN PROBE AND RECORDING MEDIUM

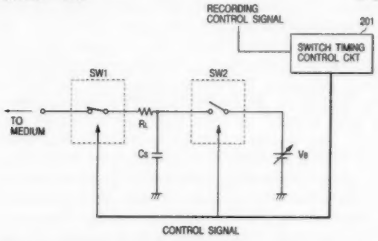
Shunichi Shido, Zama, and Ryo Kuroda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1997, Appl. No. 944,895

Claims priority, application Japan, Oct. 7, 1996, 8-284670

Int. Cl.[7] B41J *2/385;* **G11B** *9/00*

U.S. Cl. 347—159 **4 Claims**



1. An information recording apparatus, comprising:

a probe disposed in a position opposed to a recording medium;

a capacitor;

a first switch arranged between, and connecting, said probe and said capacitor;

a DC power supply supplying charge to said capacitor;

a second switch, arranged between and connecting said capacitor and said DC power supply; and

a control circuit controlling opening and closing motion of said first and second switches with reference to a recording signal,

wherein said control circuit first sets said second switch closed when said first switch is open so that the charge supplied from said DC power supply is stored in said capacitor, and then said control circuit turns said second switch open and turns said first switch closed so that the charge stored in said capacitor is applied as a voltage between said probe and said recording medium, thereby recording information.

6,040,849

INSERTABLE THERMAL PRINTER CARTRIDGES FOR DIGITAL CAMERA

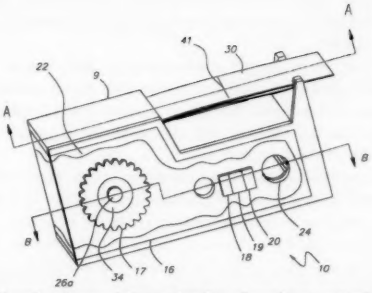
Dale F. McIntyre, Honeoye Falls, and Loretta E. Allen, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1998, Appl. No. 199,291

Int. Cl.[7] B41J *3/36;32/00*

U.S. Cl. 347—214 **5 Claims**

1. An insertable thermal printer cartridge for insertion into a digital camera or the like, comprising:



a) a housing for receiving a plurality of receivers each of which is adapted to receive colorant;

b) a donor supply roll for supplying a donor having colorant to a colorant transfer area and a donor take-up spool for receiving donor after colorant has been transferred;

c) means for serially moving the receivers and the donor from the donor supply roll to the colorant transfer area where colorant is transferred from the donor to the receiver; and

d) the housing including identifying contacts which, after the insertable thermal printer cartridge has been inserted into the camera, which provide an electrical connection to identify the type of receiver and donor in the inserted insertable thermal printer cartridge and further defining a cavity for mounting at least one battery which is adapted to provide power for colorant transfer at the colorant transfer area.

6,040,850

METHOD FOR INTERFACING BETWEEN TRANSMITTER AND RECEIVER OF DIGITAL BROADCASTING SYSTEM THROUGH SATELLITE

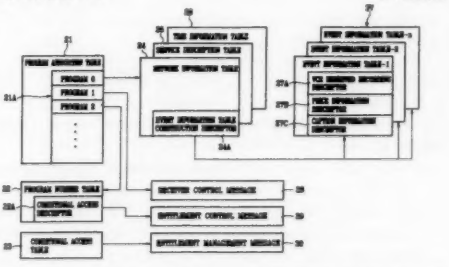
Sung-Kyong Un; Hyun-Sook Cho; Hwan-Chul Kim, and Soo-In Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications, Daejeon, and Research Institute Korea Telecom, Seoul, both of Rep. of Korea

Filed May 5, 1997, Appl. No. 851,440

Claims priority, application Rep. of Korea, Oct. 9, 1996, 1996-44702

Int. Cl.[7] H04N *7/16*

U.S. Cl. 348—10 **6 Claims**



1. A method for interfacing between a transmitter and receiver of a digital broadcasting system using a satellite, the method comprising the steps of:

searching a program association table of the receiver for a relevant program number, and detecting a receiver control message packet number;

detecting a receiver control message through the detected packet number;

detecting public switched telephone network and public switched data network numbers through the receiver control message;

searching for a network information table of the receiver and then detecting an event information table packet number at a time zone corresponding to an event information table construction descriptor in order to search for a corresponding event information table;

inserting a reserved recording descriptor into the event information table to impose an identification number on a corresponding program, thereby performing a reserved recording;

inserting a price information descriptor table into the event information table to transmit program price information; and

inserting a caption information descriptor into the event information table to provide information about a caption of a program before broadcasting the program.

6,040,851

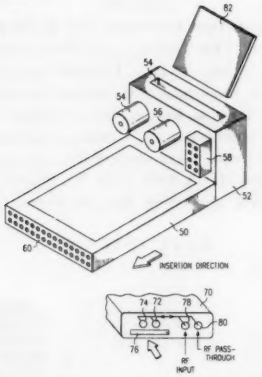
SMALL-FORMAT SUBSYSTEM FOR BROADBAND COMMUNICATION SERVICES

Vernon Cheng, San Diego, and Greg Mauro, La Jolla, both of Calif., assignors to Conexant Systems, Inc., Newport Beach, Calif.

Filed Jan. 20, 1998, Appl. No. 9,662

Int. Cl.[7] H04N *7/10*

U.S. Cl. 348—10 **12 Claims**



1. An electronic broadband network communication system comprising:

(a) a separate, connectable network-dependent digital interface conditional access module (DICAM) configured to receive an RF audiovisual signal, and generate therefrom an error-corrected digital signal in a transport stream, the DICAM including a stub;

(b) a separate network-independent common module configured to be coupled to an electronically communicate with the DICAM, for receiving the transport stream and generating at least a video output signal therefrom, the common module including a socket coupled to the common module, wherein the stub is configured to be connected to the socket so as to allow the DICAM to electronically communicate with the common module.

6,040,852

METHOD AND DEVICE FOR THE RECORDING AND REPRODUCTION OF STEREOSCOPIC VIDEO IMAGES

Herbert M. Stuettler, Rankweil, Austria, assignor to Leica Microsystems AG, Heerbrugg, Switzerland

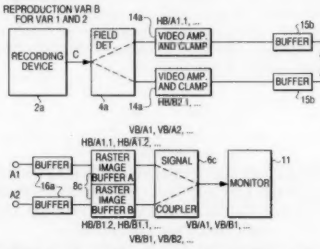
PCT No. PCT/EP94/04197, § 371 Date Jun. 26, 1996, § 102(e) Date Jun. 26, 1996, PCT Pub. No. WO95/18511, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 16, 1994, Appl. No. 663,306

Claims priority, application Switzerland, Dec. 29, 1993, 3890/93

Int. Cl.[7] H04N *7/18*

U.S. Cl. 348—43 **20 Claims**



1. A method for the recording and reproduction of stereoscopic video images of observed scenes, the video images constructed by two coordinated image-acquiring devices (**5***a*, **5***b*) such that the images include at least a right and a left frame for a right and a left image channel, the frames constructed in each case from at least one even or odd field (HB) or from respectively at least one correlated pair (VB) of an even and an odd field (HP), wherein during recording a recording device (**1***a*, **1***b*) and/or a reproducing device (**2***a*, **2***b*) are alternatingly or simultaneously fed fields (HB), respectively correlated to form a scene, from the two image-acquiring devices (**5***a*, **5***b*), or two pairs (VB), respectively correlated to form a scene, of fields from the two image-acquiring devices (**5***a*, **5***b*), without compression of a field, and wherein at least one of the fields (HB) or one of the pairs (VB) of fields is detected during the reproduction of the stereoscopic video images such that the fields (HD) or pairs (VB) of fields are assigned to an associated left or right image channel in order, subsequently, to process further all the images (HB, VB) associated with the left channel only in the left channel and all the images (HB, VB) associated with the right channel only in the right channel, and only after separate further processing to combine them alternately via a video signal coupler with a frequency such that when the combined signal is reproduced on a monitor, the monitor shows no flickering and avoids an interlaced appearance of an odd field of the left channel with an even field of the right channel and further avoids an appearance of a first field of a first channel with said first field of said first channel repeated immediately thereafter.

6,040,853

PROCESS FOR DETECTING SURFACE DEFECTS ON A TEXTURED SURFACE

Philippe Delagnes, Baye, and Dominique Barba, Carquefou, both of France, assignors to Laboratoire Central des Ponts et Chaussees, Paris, and L'Institut de Recherche et D'Enseignement Superieur aux Techniques de Electronique, Nantes Cedex, both of France

Filed Oct. 2, 1997, Appl. No. 957,987

Claims priority, application France, Oct. 2, 1996, 96 11997

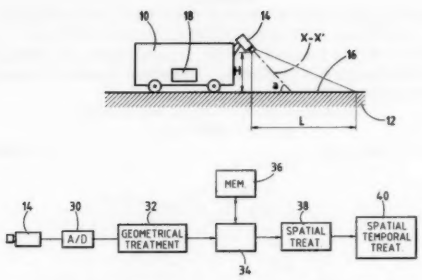
Int. Cl.[7] H04N *7/18*; **G06K** *9/00*

U.S. Cl. 348—128 **9 Claims**

1. Process for detecting surface defects in a substantially plane textured surface,

wherein it comprises the following steps of:

a) making, with the aid of an optical sensor presenting an inclination of sight with respect to the substantially plane textured surface and being in relative movement with



respect to this surface, a succession of images of parts of this surface at successive instants, each image corresponding to a surface part of length L in the direction of displacement, each image being offset from the preceding one by a length 1, 1 being equal to L/K with K, a whole, greater than 2;

b) defining sub-images corresponding to elementary portions of the surface whose length is equal to 1 in the direction of displacement, whereby for the length of portion of surface **1**, K sub-images of this portion are available;

c) extracting from these K consecutive sub-images N sub-images (Ii) corresponding to the same portion of the surface of length 1 at N successive instants with N included between 2 and K;

d) applying to each of the N sub-images (Ii) the same spatial mathematical processing in order possibly to demonstrate a configuration of presumed defect, which gives a processed intermediate sub-image (Yi);

e) applying to the first processed elementary sub-image (Yo) a combinatorial algorithm for detection of presumed defect in the elementary sub-image, whereby a spatial and temporal sub-image ST_0 is obtained;

f) iteratively repeating the application of said combinatorial algorithm to the spatial and temporal sub-image ST_{i-1} obtained at instant ti−1 and to the processed elementary sub-image Yi in order to obtain a spatial and temporal sub-image ST_i up to i=N−1; and

g) obtaining with the spatial and temporal sub-image ST_{N-1} the image of the elementary portion of the textured surface with its possible defects.

6,040,854

ELECTRO-OPTICAL PROCESS FOR THE STATIC HARMONIZATION OF WEAPON SYSTEMS AND AIRCRAFT

Thomas Esser, Karlsruhe, and Ulrich Schneidereit, Donauwoerth, both of Germany, assignors to Eurocopter Deutschland GmbH, Germany

Filed Nov. 19, 1997, Appl. No. 974,399

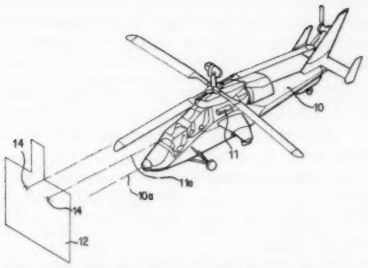
Claims priority, application Germany, Nov. 19, 1996, 196 47 756

Int. Cl.[7] **H04N** *7/18*

U.S. Cl. 348—159 **8 Claims**

1. An electro-optical process for static harmonization of weapon systems and aircraft having onboard systems which are to be measured relative to one another and on the fuselage axis, by means of video cameras, said process comprising:

at all points of an aircraft to be measured, arranging mechanical adapters in which at least one video camera can be mounted to display, on an external harmonization environment as a reference, a reproduction of an actual core axis of the onboard systems to be measured from a system of coordinates of the aircraft and thus permits a simultaneous harmonization of axes; and



generating an external environmental reference generated by means of one or two projectors mounted at the main references.

6,040,855

COLOR SIGNAL ADJUSTMENT APPARATUS

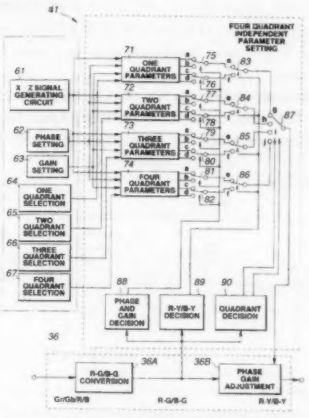
Naoyasu Gamou, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1997, Appl. No. 801,519

Claims priority, application Japan, Feb. 20, 1996, 8-032516

Int. Cl.[7] **H04N** *5/228*

U.S. Cl. 348—223 **3 Claims**



1. A color signal adjustment apparatus comprising:

first color difference signal generating means for generating a (R-G) signal and a (B-G) signal from R, G and B signals;

second color difference generating means for generating, in a (B-Y)–(R-Y) coordinate system having a (B-Y) signal and an (R-Y) signal, respectively, the (R-Y) signal and the (B-Y) signal, using the (R-G) signal and the (B-G) signal from said first color difference signal generating means, in accordance with the following equations:

$$R\text{-}Y=X\{(R\text{-}G)+Z(B\text{-}G)\}$$

where X: gain of the (R-Y) signal

Z: phase of the (R-Y) signal; and

$$B\text{-}Y=X\{(B\text{-}G)+Z(R\text{-}G)\}$$

where X: gain of the (B-Y) signal

Z: phase of the (B-Y) signal;

first parameter outputting means for outputting a gain and a phase for the (R-Y) signal and a gain and a phase for the (B-Y) signal in the first quadrant in said (B-Y)–(R-Y) coordinate system;

second parameter outputting means for outputting a gain and a phase for the (R-Y) signal and a gain and a phase for the (B-Y) signal in the second quadrant in said (B-Y)–(R-Y) coordinate system;

third parameter outputting means for outputting a gain and a phase for the (R-Y) signal and a gain and a phase for the (B-Y) signal in the third quadrant in said (B-Y)–(R-Y) coordinate system;

fourth parameter outputting means for outputting a gain and a phase for the (R-Y) signal and a gain and a phase for the (B-Y) signal in the fourth quadrant in said (B-Y)–(R-Y) coordinate system;

selection means for switchingly selecting the gain or the phase from one of said first parameter setting means, second parameter setting means, third parameter setting means and the fourth parameter setting means, and sending the selected gain or phase to said second color difference generating means; and

control means for controlling said selection means based on the (R-G) signal and the (B-G) signal from said first color difference signal generating means.

6,040,856

ELECTRONIC CAMERA CAPABLE OF PERFORMING PHOTOGRAPHY AND CHARACTER RECOGNITION

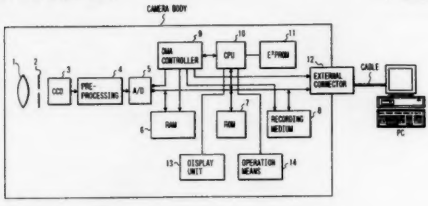
Yuji Sakaegi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of application No. 08/330,999, Oct. 28, 1994, abandoned. This application Oct. 18, 1996, Appl. No. 732,683.

Claims priority, application Japan, Oct. 29, 1993, 5-272116

Int. Cl.[7] H04N *5/76*

U.S. Cl. 348—232 **4 Claims**



1. An electronic camera comprising:

image pickup means for receiving an image and outputting an image signal corresponding thereto;

a connector for receiving from an external source (i) camera mode setting information and (ii) a character recognition program;

a first memory for storing (i) the received camera mode setting information and (ii) a file name of the character recognition program;

a second memory for storing the external source character recognition program received by said connector;

a third memory for storing a built-in photography mode control program;

a designator for designating one of a photography mode and a character recognition mode; and

signal processing circuitry for processing the image signal output from said image pickup means (i) as a photograph and in accordance with the camera mode setting information stored in said first memory when said designating means designates the photography mode, and (ii) as character signals when said designating means designates the character recognition mode.

6,040,857

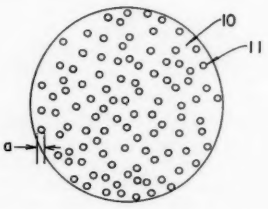
PHASE-NOISE TYPE BROAD SPECTRAL BANDWIDTH OPTICAL LOW-PASS ANTI-ALIASING FILTER

Jeffrey I. Hirsh; Joseph F. Revelli, Jr., and Alan C. G. Nutt, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1997, Appl. No. 863,648

Int. Cl.[7] H04N *5/217*

U.S. Cl. 348—241 **13 Claims**



1. An optical broad spectral bandwidth low-pass filter for use with an optical imaging system of a solid-state imager, comprising: a transparent substrate and material forming a plurality of transparent spots randomly placed on said substrate for producing a phase difference between a wave front transmitted through said spots and that portion of the substrate other than said spots to define a filter having a spatial sampling cut-off frequency which is approximately independent of the wavelength of light over a specific spectral bandwidth from a lower wavelength λ_B to an upper wavelength λ_R, said phase difference satisfying the following condition

$$\phi_o = \pi$$

where ϕ_o is the phase difference due to the spots at a certain specific wavelength, λ_o, such that

$$\lambda_B \leqq \lambda_o \leqq \lambda_R$$

and where ϕ_o is given by the relationship

$$\phi_o = 2\pi \frac{n_o - n_o'}{\lambda_o} t$$

so that

$$t = \frac{\lambda_o}{2(n_o - n_o')}$$

where n_o is the index of refraction of the material forming said spots at the specific wavelength λ_o; n_o' is the index of refraction of the medium surrounding said spots at the specific wavelength λ_o; and t is the physical thickness of said spots and wherein the solid state imager is a monochrome imager characterized by a system spectral sensitivity $S_{sys}(\lambda)$ which is common to all pixels in the array comprising said monochrome imager and which has a peak sensitivity at a wavelength λ_{sys} and wherein the specific wavelength λ_o is equal to λ_{sys}.

6,040,858

METHOD AND APPARATUS FOR EXPANDING THE DYNAMIC RANGE OF SENSED COLOR IMAGES

Eiichiro Ikeda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

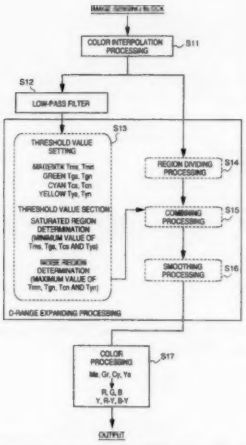
Filed Nov. 16, 1995, Appl. No. 559,074

Claims priority, application Japan, Nov. 18, 1994, 6-285066; Nov. 18, 1994, 6-285067

Int. Cl.[7] H04N *5/52;5/335;9/64;9/68*

U.S. Cl. 348—242 **31 Claims**

1. An image processing method of forming an image based on color signals output from an image sensing device, comprising:



the image picking-up step of picking up, in advance by said image sensing device, a first plurality of color signals in a standard exposure and a second plurality of color signals in a non-standard exposure;

the threshold value setting step of setting a different threshold value for each color; and

the combining step of generating a combined color signal by replacing, for each color, a part of a color signal out of the first plurality of color signals obtained in the standard exposure with a corresponding part of a corresponding color signal of the second plurality of color signals, a replacement of a color signal part being made on the basis of the threshold value set for the color.

6,040,859

IMAGE SENSING APPARATUS AND METHOD FOR DISCHARGING DARK CURRENT CHARGE STORED THEREIN

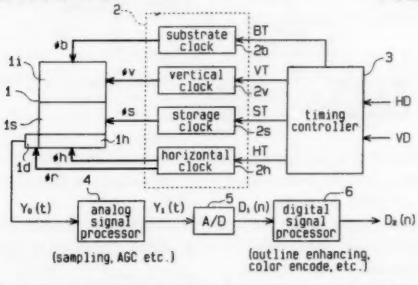
Tatsuya Takahashi, Gifu-ken, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 27, 1996, Appl. No. 774,253

Claims priority, application Japan, Nov. 30, 1995, 7-313324

Int. Cl.[7] H04N *5/335;9/64*

U.S. Cl. 348—243 **7 Claims**



1. An image sensing apparatus for sensing a target object and producing a still image signal, comprising:

a solid state image sensor including a light-receiving section having a plurality of light-receiving elements arranged in a matrix form, each light-receiving element storing an information charge generated in accordance with an incident light reflected from the target object and a storage section for temporarily storing the information charges transmitted element by element from the light-receiving section, wherein said solid state image sensor performs an electronic shutter operation for discharging the information charges in the light-receiving section; and

a clock generator including a vertical clock generating circuit, a storage clock generating circuit, a horizontal clock generating circuit and a substrate clock generating circuit, said clock generator controlling the information charge transferred between the light-receiving section and the storage section of said solid state image sensor;

said clock generator performing a first discharging operation for discharging noise-containing information charges previously existing in the light-receiving section, a first transferring operation for transferring noise-containing information charges previously existing in the storage section in a reverse direction from the storage section to the light-receiving section, a second discharging operation for discharging noise-containing information charges transferred from the storage section into the light-receiving section, an image sensing operation for storing the information charges generated in accordance with the incident light reflected from the target object in the light-receiving section for a predetermined period of time, and a second transferring operation for transferring information charges stored in the light-receiving section in a forward direction from the light-receiving section to the storage section.

6,040,860

IMAGING APPARATUS FOR SUPPLYING IMAGES WITH RICH GRADATION ACROSS THE ENTIRE LUMINANCE RANGE FOR ALL SUBJECT TYPES

Akihiro Tamura, Hirakata; Shigeo Sakaue, Toyonaka, and Takeshi Hamasaki, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

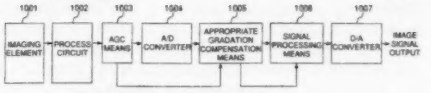
PCT No. PCT/JP95/01990, § 371 Date Mar. 28, 1997, § 102(e) Date Mar. 28, 1997, PCT Pub. No. WO96/10886, PCT Pub. Date Apr. 11, 1996

PCT Filed Sep. 29, 1995, Appl. No. 809,714

Claims priority, application Japan, Sep. 30, 1994, 6-236732; Oct. 6, 1994, 6-242774

Int. Cl.[7] H04N *5/208*

U.S. Cl. 348—252 **10 Claims**



1. An imaging apparatus comprising:

an imaging element for outputting an image signal,

an AGC circuit for controlling the gain of the image signal output from the imaging element,

an AGC control means for controlling an output signal level of the AGC circuit to a constant level,

a gradation compensation means for applying gradation compensation by varying a gain of each luminance level of the image signal output of the AGC circuit based on a gradation compensation coefficient,

a feature quantity extraction means for extracting an image feature quantity from the image signal output of the AGC circuit,

an image evaluation means for determining the amount of backlighting and strong normal lighting from the feature quantity extracted by the feature quantity extraction means, and outputting the degree of gradation compensation to be applied, and

a gradation compensation suppression means for suppressing the degree of gradation compensation output from the image evaluation means and determining the gradation compensation coefficient according to a control signal from the AGC control means,

wherein the gain of the gradation compensation means is controlled according to the gradation compensation coefficient of the gradation compensation suppression means, and the gradation-compensated image signal is output.

6,040,861

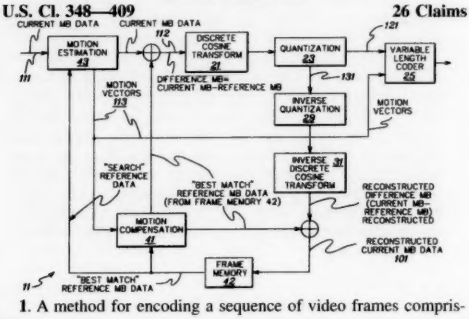
ADAPTIVE REAL-TIME ENCODING OF VIDEO SEQUENCE EMPLOYING IMAGE STATISTICS

Lilla Boroczky, Endicott; Charlene Ann Gebler, Vestal; John M. Kaczmarczyk; Edward F. Westermann, both of Endicott, and Robert L. Woodard, Newark Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1997, Appl. No. 948,442

Int. Cl.[7] H04N *7/18*

U.S. Cl. 348—409 **26 Claims**



1. A method for encoding a sequence of video frames comprising:

analyzing the sequence of video frames to derive information on at least one characteristic thereof, said at least one characteristic comprising at least one of an intraframe characteristic or an interframe characteristic;

encoding the sequence of video frames employing at least one controllable parameter;

buffering the sequence of video frames and controlling timing of said encoding of the sequence of video frames so that for each frame of at least some frames of said sequence of video frames said analyzing precedes said encoding to derive said information on the at least one characteristic relative each frame of said at least some frames of the sequence of video frames prior to said encoding of the frame; and

dynamically adapting said encoding of the sequence of video frames using said information on the at least one characteristic thereof to adjust said at least one controllable parameter employed in encoding the sequence of video frames, wherein said encoding is dynamically adaptive to change in the at least one characteristic of the sequence of video frames.

6,040,862

CODING METHOD AND RECORDING AND REPRODUCING APPARATUS

Toshiya Asai, and Takato Narita, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 08/720,971, Oct. 16, 1996. This application Jul. 16, 1998, Appl. No. 118,689.

Claims priority, application Japan, Oct. 20, 1995, 7-297493

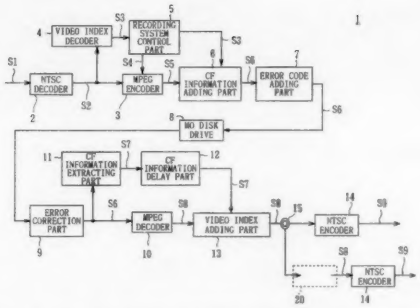
Int. Cl.[7] H04N *7/12;11/02;11/04*

U.S. Cl. 348—409 **6 Claims**

1. A method for coding a video signal made up of a plurality of sequential video frames, comprising the steps of:

providing correspondence information which relates color frame information values to types of coding, said color frame information values and said types of coding being related on a one to one basis such that for each value of color frame information there is only one corresponding type of coding;

determining a value of color frame information for each said frame and selecting the type of coding to be used on said frame by referencing said correspondence information to find the type of coding corresponding to said determined color frame information; and



coding said image frames according to the coding types selected in said determining step.

6,040,863

METHOD OF CODING AND DECODING MOTION VECTOR AND APPARATUS THEREFOR, AND METHOD OF CODING AND DECODING PICTURE SIGNAL AND APPARATUS THEREFOR

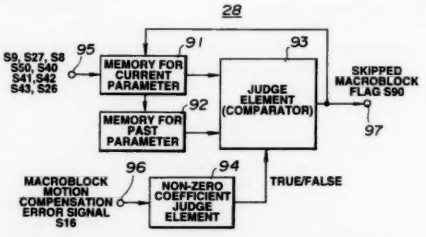
Motoki Kato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of application No. 08/886,804, Jul. 2, 1997, Pat. No. 5,946,042, which is a division of application No. 08/770,585, Dec. 19, 1996, Pat. No. 5,701,164, which is a continuation of application No. 08/290,888, filed as application No. PCT/JP94/00473, Mar. 24, 1994. This application Dec. 18, 1998, Appl. No. 216,437.

Claims priority, application Japan, Mar. 24, 1993, 5-065689; Apr. 30, 1993, 5-124686

Int. Cl.[7] H04N *7/32*

U.S. Cl. 348—415 **4 Claims**


28
S9, S27, S8 S50, S40 S41, S42 S43, S26
MEMORY FOR CURRENT PARAMETER
MEMORY FOR PAST PARAMETER
JUDGE ELEMENT (COMPARATOR)
SKIPPED MACROBLOCK FLAG S90
MACROBLOCK MOTION COMPENSATION ERROR SIGNAL S16
NON-ZERO COEFFICIENT JUDGE ELEMENT
TRUE/FALSE

1. A picture signal coding method comprising the step of:

coding an input picture signal every macroblock on the basis of a plurality of modes,

whereby when picture coding type in the plurality of modes is P picture and picture structure in the plurality of modes is frame structure,

the method further comprises the steps of:

judging, every coded macroblock, whether or not the following conditions are satisfied: (i) predictive error signal is zero, (ii) motion vector is zero, (iii) motion compensation mode in the plurality of modes is the forward prediction, and (iv) prediction type in the plurality of modes is frame predictions; and

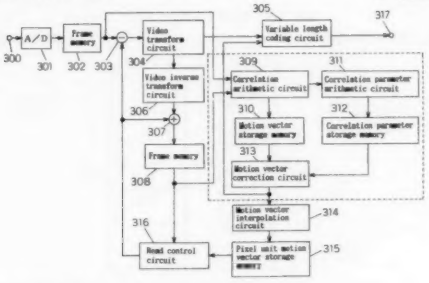
processing the coded macroblock as a skipped block only when said conditions are satisfied.

6,040,864

MOTION VECTOR DETECTOR AND VIDEO CODER

Minoru Etoh, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of application No. 08/329,276, Oct. 26, 1994, abandoned. This application Jun. 9, 1997, Appl. No. 871,688.
Claims priority, application Japan, Oct. 28, 1993, 5-270836
Int. Cl.[7] H04N *7/32*
U.S. Cl. 348—416 **9 Claims**



1. A motion vector detector comprising:

a memory for storing a coded image,

a region correlation arithmetic means, the region correlating arithmetic means reading out frame images before and after a determined time from the memory in plural partial regions of the image, calculating error between partial regions of different frame images, and determining a motion vector between partial regions with a minimum error and an error value in a vicinity of the motion vector,

an error function arithmetic means for determining an error function, which continuously represents a luminance difference of the partial region associated with any displacement motion vector, from the error value in the motion vector vicinity,

a motion vector evaluation means for obtaining an evaluation function which represents an amount of a motion vector differential between each partial region and each adjacent partial region, and

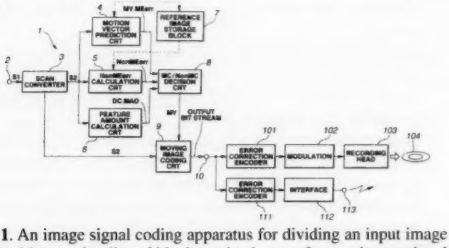
an optimizing means for determining the parameter of the motion vector so as to minimize a sum of the error function and the evaluation function.

6,040,865

IMAGE SIGNAL CODING METHOD AND APPARATUS, IMAGE SIGNAL TRANSMISSION METHOD, AND SIGNAL RECORDING MEDIUM

Motoki Kato; Nobuhiro Igi, and Kazunori Yasuda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1997, Appl. No. 991,517
Claims priority, application Japan, Dec. 18, 1996, 8-338236
Int. Cl.[7] H04N *7/32*
U.S. Cl. 348—416 **15 Claims**



1. An image signal coding apparatus for dividing an input image signal into a plurality of blocks and using a reference image signal for each of said blocks so as to carry out motion compensative prediction coding, said apparatus comprising:

a division unit for dividing said image signal into a plurality of blocks;

a first calculation unit for calculating a motion vector prediction residue for which a motion compensation is carried out by using said reference image signal for each of said blocks;

a second calculation unit for calculating a residue of a block for which no motion compensation is carried out;

a third calculation unit for calculating an average luminance value of pixel data within each of blocks and a value representing flatness of said block;

a motion compensation/non-motion compensation decision unit for deciding whether to carry out a motion compensative coding according to a comparison result obtained by comparing a magnitude of a motion vector prediction residue of said block to a magnitude of a residue of said block, said motion compensation/non-motion compensation decision unit adaptively switching between decision making region division types to be used in said motion compensation/non-motion compensation decision, according to said average luminance value and said flatness value of said block; and

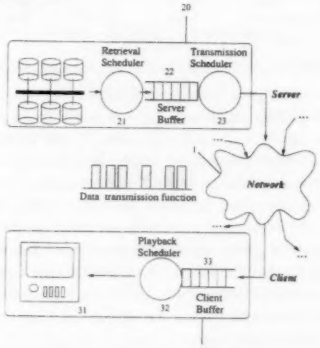
a coding unit for carrying out a motion/compensative prediction coding for each of the blocks according to a result of said decision.

6,040,866

TRANSMISSION OF VARIABLE-BIT-RATE INFORMATION DATA ON CONSTANT-BIT-RATE CHANNEL

Meng-Chang Chen; Jan-Ming Ho; Ming-Tat Ko, and Ray-I Chang, all of Institute of Information Science Academia Sinica, Nankang, Taipei, Taiwan

Filed Aug. 19, 1997, Appl. No. 912,849
Int. Cl.[7] H04N *7/12;11/02;11/04*
U.S. Cl. 348—419 **3 Claims**



1. A method for transmitting variable-bit-rate information through constant-bit-rate channels to a recipient comprising a memory and a playback device, comprising the steps of:

obtaining an information stream v, $v=\{f_0, f_1, f_2, \ldots, f_{n-1}\}$ wherein f_i denotes an with information frame of said information stream, and wherein said information frames are numbered from 0 to n−1, i.e., $0 \leq i < n$, for a peak transmission rate r of said channel and a buffer size b of the recipient;

calculating the cumulative frame size F_i of said information stream v, $F_i=F_{i-1}+f_i$, wherein $0 \leq i < n$ and $F_{i-1}=0$;

determining a lazy transmission schedule L_i for said information stream v, $L_i=\{r; t_0,t_1,t_2, \ldots, t_{2p+1}\}$ wherein $0 \leq p < n$, times t_0, t_2, t_4, . . . t_{2p} represent starting points of transmission of respective frames f_0 to f_{n-1}, and times t_1, t_3, t_5, . . . t_{2p+1} represent end points of transmission of said respective frames f_0 to f_{n-1}, such that none of said information frames is transmitted to said recipient before said information frames are required for play back;

determining a revised transmission schedule γ_A for the reorganized information stream $v,\gamma_A=\{r; t_0,t_1,t_2, \ldots, t_{2q+1}\}$ wherein

$0 \leqq p < n$, times t_0, t_2, t_4, . . . t_{2q} represent starting points of transmission of said respective frames f_0 to f_{n-1} according to said revised transmission schedule, and times t_1, t_3, t_5, . . . t_{2q+1} represent end points oftransmission of said respective frames f_0 to f_{n-1} according to said revised transmission schedule, such that the information stream is transmitted as long as a vacancy in the buffer memory of said recipient is available to receive said information stream, said revised transmission schedule thereby constituting an aggressive transmission schedule; and

transmitting said information data according to said aggressive transmission schedule when said buffer is available to receive said information stream, and transmitting said information frame according to said lazy transmission schedule, in which information frames are transmitted only when required for play back, when said buffer is not available to receive said information stream.

6,040,867

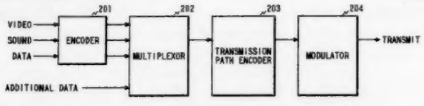
TELEVISION SIGNAL RECEIVING APPARATUS AND METHOD SPECIFICATION

Yumi Bando; Takumi Okamura, and Toshinori Murata, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 20, 1997, Appl. No. 803,532

Int. Cl.[7] H04N *7/18*

U.S. Cl. 348—423 **7 Claims**



1. A television signal receiving apparatus, comprising:

a channel decoder which receives a television signal containing a video signal, a sound signal, a data signal, and additional data multiplexed therein for tuning, demodulation, and error correction to produce a channel decoded signal;

a demultiplexor which separates the video signal, the sound signal, the data signal and additional data multiplexed from the channel decoded signal to produce coded data of each of the video signal, the sound signal, and the data signal and to extract service information as one of the additional data;

a storage device which stores the service information extracted from said demultiplexor;

a write controller which controls writing of the service information into said storage device in accordance with a user command input by a user;

a read controller which controls reading of the service information from said storage device in accordance with the user command input by a user;

a source decoder which decodes the coded data outputted from said demultiplexor by using the service information outputted from said storage device to produce the video signal, the sound signal, and the data signal; and

wherein said storage device is controlled by said write controller to memorize at least service information having a transmitting period greater than a predetermined time and having a quantity of information greater than a predetermined amount, and is controlled by said read controller to output necessary memorized information as required by the user to thereby enhance the processing speed of the service information for a quick response to the user command.

6,040,868

DEVICE AND METHOD OF CONVERTING SCANNING PATTERN OF DISPLAY DEVICE

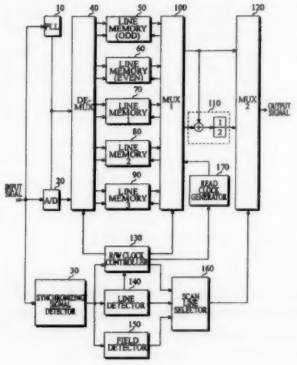
Sung-Gon Jun, Kyungki-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Feb. 14, 1997, Appl. No. 801,783

Claims priority, application Rep. of Korea, Feb. 17, 1996, 96/3969

Int. Cl.[7] H04N *7/01;11/20*

U.S. Cl. 348—448 **10 Claims**



1. A device for converting scanning patterns from interlaced scanning to sequential scanning, comprising:

means for receiving an input interlaced scanning video signal having alternating odd and even fields of scanning lines;

a first line memory for storing picture elements of the input interlaced scanning video signal in a first line of an odd field;

a second line memory for storing picture elements of the input interlaced scanning video signal in a last line of an even field;

a plurality of sequential line memories serving as buffers for storing picture elements of the input interlaced scanning video signal in sequence for each scanning line;

a demultiplexer for sequentially inputting the picture elements of the input interlaced scanning video signal into each of said first line memory, said second line memory and each of said plurality of sequential line memories in accordance with a write clock signal;

a first multiplexer connected to said first line memory, said second line memory and said plurality of sequential line memories, for producing a first output signal by multiplexing between the picture elements of the input interlaced scanning video signal stored in one of said first line memory, said second line memory and selected one from said plurality of sequential line memories in accordance with a read clock signal;

an interpolator for interpolating picture elements between adjacent scanning lines of the input interlaced scanning video signal in one of said odd field and said even field to produce interpolated picture elements;

a second multiplexer connected to said first multiplexer and said interpolator, for producing a second output signal representing a sequential scanning video signal by multiplexing between the picture elements contained in said first output signal and the interpolated picture elements provided from said interpolator; and

a control section for controlling operations of said demultiplexer, said first and second multiplexers.

6,040,869

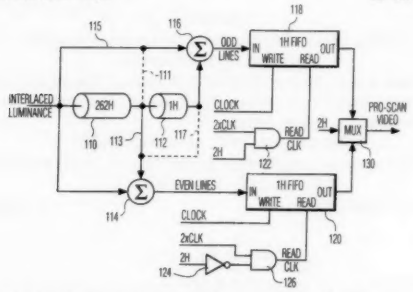
METHOD AND APPARATUS FOR CONVERTING AN INTERLACE-SCAN VIDEO SIGNAL INTO A NON-INTERLACE-SCAN VIDEO SIGNAL

Lee Robert Dischert, Burlington, N.J., assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Mar. 31, 1998, Appl. No. 52,771

Int. Cl.[7] H04N *7/01;11/02*

U.S. Cl. 348—448 **11 Claims**



1. An interlace-scan to progressive-scan video signal conversion system comprising:

a terminal for receiving the interlace-scan video signal;

a first delay element, coupled to the terminal for delaying the interlace-scan video signal by a number, N, of horizontal line intervals to produce a first delayed video signal, wherein N horizontal line intervals is less than one field period but N+1 horizontal line intervals is greater than one field period;

a second delay element, coupled to the first delay element for delaying the first delayed video signal by one horizontal line interval to produce a second delayed video signal;

a first interpolator which combines the received interlace-scan video signal with the first delayed video signal to produce a first interpolated signal;

a second interpolator which combines the received interlace-scan video signal with the second delayed video signal to produce a second interpolated signal;

a first speed-up memory coupled to the first interpolator to receive samples of the first interpolated signal at a first sample rate and to provide the samples of the first interpolated signal, as an output signal, at a second sample rate which is twice the first sample rate;

a second speed-up memory coupled to the second interpolator to receive samples of the second interpolated signal at the first sample rate and to provide the samples of the second interpolated signal, as an output signal, at the second sample rate; and

a multiplexer, coupled to the first and second speedup memories, to alternately provide the output signals of the first and second speedup memories as a progressive-scan video signal.

6,040,870

METHOD AND APPARATUS FOR NESTING SECONDARY SIGNALS WITHIN A TELEVISION SIGNAL

David Small, San Jose, Calif., assignor to Shoot the Moon Products, Inc., Pleasanton, Calif.

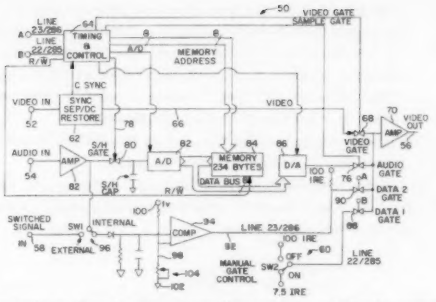
Continuation of application No. 08/523,848, Sep. 5, 1995, Pat. No. 5,808,689, which is a continuation of application No. 08/230,490, Apr. 20, 1994, abandoned. This application Sep. 14, 1998, Appl. No. 153,098.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04N *7/08;7/04*

U.S. Cl. 348—476 **19 Claims**

1. A method of transmitting secondary information having a digital format within a television signal, the method comprising:



selecting a first plurality of scan lines to be encoded with control information and the secondary information;

producing samples of the secondary information by sampling the secondary information at a predetermined rate; and

encoding overscan portions of active video regions of the first plurality of scan lines with the control information and a plurality of the samples, the control information indicating that the plurality of the samples are present in the first plurality of scan lines, the first plurality of scan lines being encoded with the samples at a temporally compressed rate within the overscan portions of the active video regions.

6,040,871

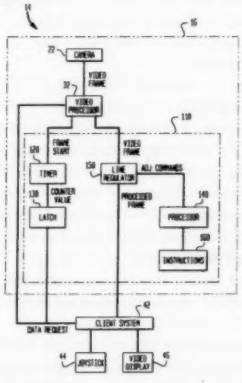
METHOD AND APPARATUS FOR SYNCHRONIZING VIDEO SIGNALS

Russell L. Andersson, Manalapan, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 27, 1996, Appl. No. 777,339

Int. Cl.[7] H04N *9/475;7/01;5/445*

U.S. Cl. 348—510 **18 Claims**



12. A system for synchronizing a frame of video data with a client system, comprising:

a timer for measuring a sampling period of said client system;

a processor for:

(i) receiving said frame of video data;

(ii) detecting a duration of said frame of video data:

(iii) computing a desired duration of said frame of video data necessary to make said duration of said frame of video data match said sampling period of said client system by computing a required number of video lines of which said frame of video data should consist in order to make said frame of video data of said desired duration;

(iv) computing an adjustment necessary to make said frame of video data of said desired duration; and

an adjuster, controlled by said processor, for adjusting said duration of said frame of video data to match said sampling period of said client system.

6,040,872

COMMUNICATION CONTROL DEVICE AND METHOD FOR TELEVISION RECEIVER

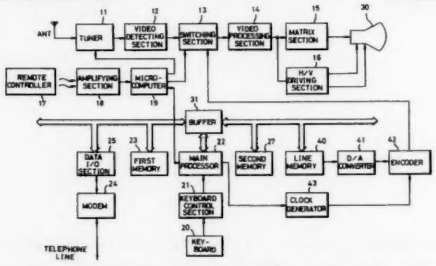
Hak Lyang Kim, Taegu, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Oct. 27, 1995, Appl. No. 549,560

Claims priority, application Rep. of Korea, Oct. 28, 1994, 94-27986; Dec. 28, 1994, 94-37803

Int. Cl.[7] H04N *7/00;7/10*

U.S. Cl. 348—553 **4 Claims**



1. A communication control device for a television receiver comprising:

a television/communication switching section adapted to select one of an image signal of a television broadcasting channel and a television communication image signal for computer communication, wherein each of the image signal of a television broadcasting channel and the television communication image signal comprises a composite video signal appropriate to television display;

key input means for manually inputting a key signal for performing the computer communication;

a controller adapted to control the operation of said television/communication switching section and controlling transmission and reception for the computer communication in accordance with the key signal from said key input means;

a modem, connected to an external communication line, for modulating and demodulating communication information to be transmitted and received;

data memory for storing the communication data being inputted through said modem and outputting the stored communication data under the control of said controller; and

an image interface adapted to convert the communication data received through said modem or the data stored in said data memory into the television communication image signal under the control of said controller, and further adapted to output the television communication image signal to a television screen through said television/communication switching section, said image interface including a line memory for converting the input data of frequency f suitable for sequential scanning into an output signal of frequency f/2 suitable for interlaced scanning, a digital-to-analog converter for converting the output signal of said line memory into an analog signal, an encoder for converting an output signal of said digital-to-analog converter into a composite video signal, and a clock generating section for providing a clock signal to said encoder.

6,040,873

APPARATUS AND METHOD FOR PROCESSING MOVING IMAGE DATA

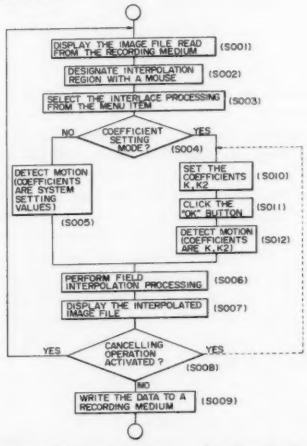
Nobuaki Izumi, Chiba; Shinichi Fukushima, Kanagawa, and Junichi Tsukamoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 14, 1997, Appl. No. 856,247

Claims priority, application Japan, May 17, 1996, 8-146498

Int. Cl.[7] H04N *7/01*

U.S. Cl. 348—559 **9 Claims**


DISPLAY THE IMAGE FILE READ FROM THE RECORDING MEDIUM (S001)
DESIGNATE INTERPOLATION REGION WITH A MOUSE (S002)
SELECT THE INTERLACE PROCESSING FROM THE MENU ITEM (S003)
COEFFICIENT SETTING MODE? (S004)
NO
YES
DETECT MOTION (COEFFICIENTS ARE SYSTEM SETTING VALUES) (S005)
SET THE COEFFICIENTS (S010)
CLICK THE "OK" BUTTON (S011)
DETECT MOTION (COEFFICIENTS ARE K,K2) (S012)
PERFORM FIELD INTERPOLATION PROCESSING (S006)
DISPLAY THE INTERPOLATED IMAGE FILE (S007)
CANCELLING OPERATION ACTIVATED? (S008)
YES
NO
WRITE THE DATA TO A RECORDING MEDIUM (S009)

1. An apparatus for processing moving image data so as to obtain stationary image data representative of a desired image picture and suitable for display on a display device, said apparatus comprising:

means for designating a first region in an image picture;

motion detecting means for detecting motion in the designated first region in accordance with at least one motion detection coefficient, in which each said motion detection coefficient is setable by an operator to a desired value;

interpolating means for interpolating the image data in accordance with the motion detection results by use of a predetermined interpolation technique;

means for causing the interpolated image data to be outputted for display on the display device for observation by the operator; and

means, operative when the operator determines that the display is unacceptable, for performing one of (i) designating a second region in the image picture, detecting motion in the second designated region in accordance with the at least one motion detection coefficient, interpolating the image data in accordance with the motion detecting results of the second designated region and causing the latest interpolated image data to be outputted for display on the display device for observation by the operator and (ii) resetting at least one said motion detection coefficient, detecting motion in the first designated region in accordance with the at least one reset motion detection coefficient, interpolating the image data in accordance with the latest motion detecting results of the first designated region and causing the latest interpolated image data to be outputted for display on the display device for observation by the operator.

6,040,874

PERIPHERAL UNIT CONNECTION STATUS DISPLAY DEVICE OF COMPOSITE VIDEO APPARATUS AND METHODS THEREOF

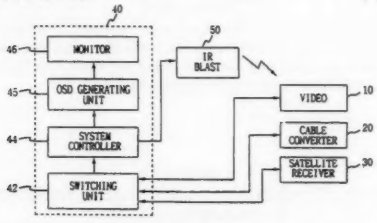
Jin-Bog Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd, Rep. of Korea

Filed Apr. 24, 1998, Appl. No. 65,710

Claims priority, application Rep. of Korea, Apr. 29, 1997, 97-16042

Int. Cl.[7] H04N *5/50*

U.S. Cl. 348—569 **7 Claims**



1. A peripheral unit connection status display device in a composite video apparatus, comprising:

a system controller for outputting a first control signal to operate peripheral units when a user selects a mode for displaying the connection status of the peripheral units and, for outputting a second control signal to generate a character according to a determination result about what peripheral units are connected to a television system;

a switching unit coupled to the system controller and the peripheral units for selecting a signal among various signals output from the peripheral units connected to the television system in response to the first control signal from the system controller; and

an on screen display (OSD) generating unit coupled to the system controller and a video display device for displaying the connection status of the peripheral units to the television system in response to said second control signal.

6,040,875

METHOD TO COMPENSATE FOR A FADE IN A DIGITAL VIDEO INPUT SEQUENCE

Charles E. Boice; John M. Kaczmarczyk, both of Endicott; Agnes Y. Ngai, Endwell, and Michael P. Vachon, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1998, Appl. No. 46,290

Int. Cl.[7] H04N *9/74;7/12;5/14*

U.S. Cl. 348—595 **37 Claims**

1. A method to compensate for a fade in a digital video input sequence which is compressed according to a video compression standard in which a first encoding processor applies an encoding algorithm for the compression, the video input sequence comprising a group of sequential picture frames, each frame comprising an array of pixels, each pixel having associated luminance and chrominance values, the method comprising the steps of:

(a) dividing each frame of a current frame into two fields,

(b) dividing each field of the current frame into at least one field band,

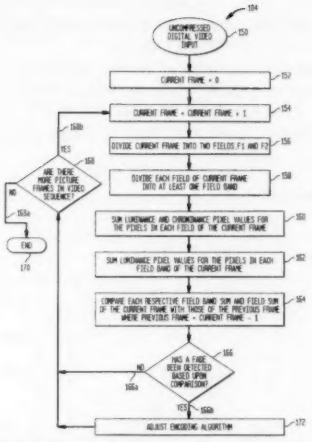
(c) summing the luminance and summing the chrominance pixel values for the pixels in each field of the current frame,

(d) summing the luminance pixel values for the pixels in each field band of the current frame,

(e) comparing each respective field band sum and field sum of the current frame with that of the previous frame in the video input sequence,

(f) detecting whether a fade has occurred based upon the comparison in step (e),

(g) adjusting the encoding algorithm if a fade has occurred, and


UNCOMPRESSED DIGITAL VIDEO INPUT
150
CURRENT FRAME = 0
152
CURRENT FRAME = CURRENT FRAME + 1
154
DIVIDE CURRENT FRAME INTO TWO FIELDS F1 AND F2
156
DIVIDE EACH FIELD OF CURRENT FRAME INTO AT LEAST ONE FIELD BAND
158
SUM LUMINANCE AND CHROMINANCE PIXEL VALUES FOR THE PIXELS IN EACH FIELD OF THE CURRENT FRAME
160
SUM LUMINANCE PIXEL VALUES FOR THE PIXELS IN EACH FIELD BAND OF THE CURRENT FRAME
162
COMPARE EACH RESPECTIVE FIELD BAND SUM AND FIELD SUM OF THE CURRENT FRAME WITH THOSE OF THE PREVIOUS FRAME WHERE PREVIOUS FRAME = CURRENT FRAME - 1
164
WAS A FADE BEEN DETECTED BASED UPON COMPARISON?
166
ADJUST ENCODING ALGORITHM
172
END
170
ARE THERE MORE PICTURE FRAMES IN VIDEO SEQUENCE?
168
YES
NO

(h) repeating steps (a) through (g) for at least one subsequent frame in the input video sequence.

6,040,876

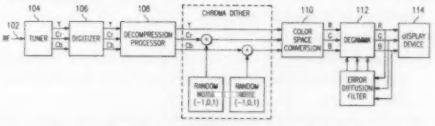
LOW INTENSITY CONTOURING AND COLOR SHIFT REDUCTION USING DITHER

Gregory S. Pettitt, Rowlett, and Vishal Markandey, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/005,195, Oct. 13, 1995. This application Oct. 11, 1996, Appl. No. 729,121.

Int. Cl.[7] H04N *5/21*

U.S. Cl. 348—624 **7 Claims**



1. A method of avoiding perceptual artifacts in an image display, said method comprising the steps of:

receiving a gamma corrected image signal, said gamma corrected image signal comprised of at least one luminance component and at least one chrominance component;

dithering one or more of said at least one chrominance component to form a dithered image signal, said dithering step operable to reduce image contouring in said dithered image signal;

converting said image signal to an RGB (red, green, blue) image signal;

removing said gamma correction from said RGB image signal; and

wherein said RGB image signal is comprised of three digital signal components, said method further comprising the step of reducing the number of data bits of said three signal components of said RGB image signal by dividing each of said digital signal components into a group of most significant bits and a group of least significant bits for each pixel of a pixelated image, wherein said most significant bits are transmitted to a spatial light modulator and said least significant bits are diffused to other pixels in said pixelated image.

6,040,877

AIR-COOLING APPARATUS FOR A PROJECTION TELEVISION

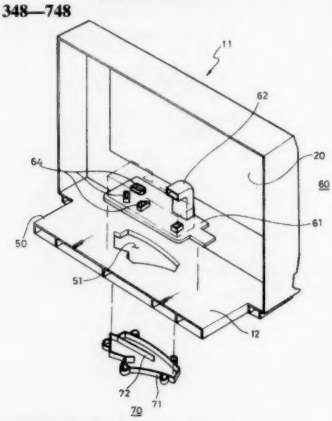
Jong-ho Won, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 28, 1998, Appl. No. 66,873

Claims priority, application Rep. of Korea, May 9, 1997, 97-17756

Int. Cl.[7] H04N *5/74*

U.S. Cl. 348—748 **5 Claims**



1. A projection television comprising:

a front casing forming an external appearance of a body of said projection television, said front casing having a screen installed therein;

a rear casing coupled to said front casing, said rear casing having a reflection mirror installed therein;

a base integrally formed at a lower portion of said front casing, said base having an opening and defining a space below the opening;

an image projector having heat emitting elements including a beam source, dichroic mirrors, a liquid crystal panel and a projection lens therein; and

an air-cooling apparatus which includes:

a blowing duct installed above the opening in said base, said image projector being installed above said blowing duct; and

an air distributing member disposed within the space and cooperating with said blowing duct so as to distribute air blown by said blowing duct to the heat emitting elements of said image projector, thereby to cool the heat emitting elements.

6,040,878

APPARATUS, METHODS AND MATERIAL FOR ABSORBING MAGNETIC RADIATION

Billy Dan Jones, Los Altos, Calif., assignor to Field Management Services, Inc., Los Angeles, Calif.

Division of application No. 07/632,148, Dec. 21, 1990, Pat. No. 5,400,088. This application Mar. 20, 1995, Appl. No. 407,376.

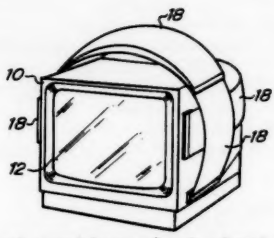
Int. Cl.[7] H04N *5/65*

U.S. Cl. 348—819 **2 Claims**

1. A multiple-layer magnetic shielding material comprising:

a first layer of grain-oriented ferromagnetic material in the range from M3 to M7 having its grain orientation extending in a first direction; and

a second layer of grain-oriented ferromagnetic material in the range from M3 to M7 having its grain orientation extending in a second direction;



said first and second layers of grain-oriented ferromagnetic material being secured together with the grain orientation extending in the first direction being orthogonal to the grain orientation extending in the second direction.

6,040,879

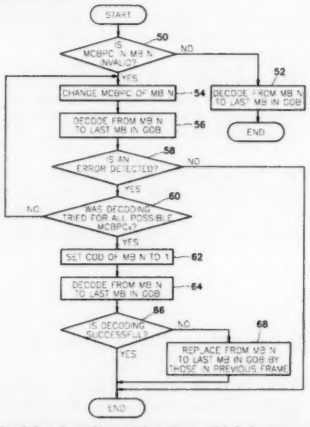
METHOD FOR DECODING VIDEO DATA CORRUPTED BY CHANNEL NOISE

Dong seek Park, Daegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 21, 1997, Appl. No. 844,654

Int. Cl.[7] H04N *7/32*

U.S. Cl. 348—845.1 **3 Claims**



1. A method for decoding video data which is arranged in a first unit, the first unit including a plurality of data units, and each of the data units including information on a status of the respective data unit, said method comprising the steps of:

(a) determining whether the status information in a current data unit is invalid or not;

(b) changing the status information into another one among a set of possible status information to decode the video data from the current data unit to a last data unit in a current first unit on the basis of the changed status information if it is determined that the status information in the data unit is invalid in said step (a);

(c) changing a flag representing an encoding scheme of the video data such that the flag indicates that the data unit is encoded in an inter-frame mode if the decoding of video data from the current data unit to the last data unit in the current first unit was successful for none of the possible status information;

(d) decoding the video data from the current data unit to the last data unit in the current first unit according to the changed flag; and

(e) replacing the video data from the current data unit to the last data unit in the current first unit with corresponding data units in a previous frame if the decoding of the video data in said step (d) is unsuccessful.

6,040,880

DISPLAY DEVICE

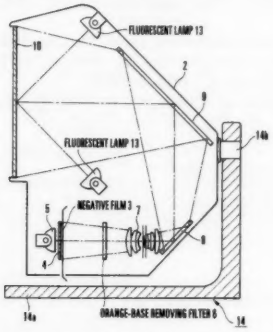
Takayuki Tsuboi, Yokohama; Mineto Yagyu, Sagamihara; Akihiko Nagano, Ichihara, and Hiroshi Kikuchi, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1997, Appl. No. 987,895

Claims priority, application Japan, Dec. 16, 1996, 8-335399; Jun. 30, 1997, 9-174595; Jun. 30, 1997, 9-174602

Int. Cl.[7] G02F *1/1335*

U.S. Cl. 349—5 **17 Claims**



1. A display device comprising:

a spatial light modulator capable of writing therein an image and capable of reading therefrom the written image by converting the image; and

an illumination device which transmissively illuminates said spatial light modulator through respective different paths for writing the image and for reading the image; said illumination device including a first illumination element for writing the image and a second illumination element for reading the image, and said second illumination element being located outside a writing optical path of an enlarged optical system formed by the first illumination element.

6,040,881

PROJECTION TYPE DISPLAY APPARATUS WITH COLOR OPTIMIZED ANTI-REFLECTION FILMS

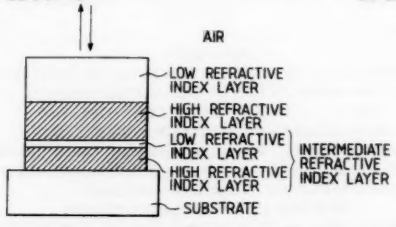
Osamu Koyama, c/o Canon Kabushiki Kaisha, 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo, Japan

Filed Jul. 16, 1997, Appl. No. 895,352

Claims priority, application Japan, Jul. 17, 1996, 8-187478

Int. Cl.[7] G02F *1/1335;* **G02B** *1/10*

U.S. Cl. 349—8 **30 Claims**



13. A projection type display apparatus for superposing a plurality of images of primary colors upon one another to thereby form a colored image, comprising:

a plurality of optical elements each of which includes at least one of:

(a) an element of a color-combining prism passing light of one of said primary colors;

(b) an element of a color-separating prism passing light of one of said primary colors; and

(c) a lens passing light of one of said primary colors; and

a plurality of anti-reflection films wherein each of said anti-reflection films:

(a) is formed on one of said plurality of optical elements,

(b) is optimized or substantially optimized for a corresponding primary color,

(c) is formed of two kinds of materials;

(d) has a layer of high refractive index, a layer of low refractive index and a layer of intermediate refractive index, and said layer of intermediate refractive index is constructed of equivalent film of said layer of high refractive index and said layer of low refractive index; and

(e) has one of the following configurations:

(i) substrate-$\lambda/4$ (intermediate refractivity layer)-$\lambda/4$ (high refractivity layer)-$\lambda/4$ (low refractivity layer)-air;

(ii) substrate-$\lambda/2$ (intermediate refractivity layer)-$\lambda/2$ (high refractivity layer)-$\lambda/4$ t(low refractivity layer)-air; or

(iii) substrate-$3\lambda/4$ (intermediate refractivity layer)-$\lambda/2$ (high refractivity layer)-$\lambda/4$ (low refractivity layer)-air.

6,040,882

LIQUID CRYSTAL DISPLAY DEVICE HAVING "H" CHARACTER COMMON ELECTRODE AND METHOD OF FABRICATING THEREOF

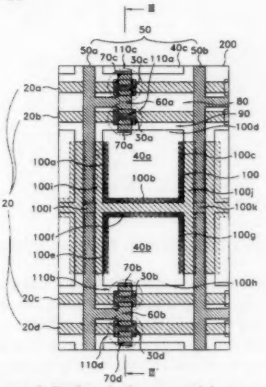
Jung-Mok Jun, Seoul, and Seok-Lyul Lee, Kyoungki-do, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Oct. 16, 1997, Appl. No. 951,410

Claims priority, application Rep. of Korea, Oct. 16, 1996, 96-46299

Int. Cl.[7] G02F *1/1343*

U.S. Cl. 349—39 **13 Claims**



1. A liquid crystal display device comprising:

a transparent substrate;

a plurality of scanning signal lines arranged on a surface of said transparent substrate, the scanning signal lines each having a pair of sub scanning signal lines, the scanning signal lines being arranged such that a number of pairs of sub scanning signal lines are repeated with a first distance, one of each pair of sub scanning signal lines being arranged adjacent to the other of each pair of sub scanning signal lines with a second distance being shorter than said first distance;

a plurality of display signal lines which intersect said plurality of scanning signal lines, being arranged on said surface of the transparent substrate, the pair of sub scanning signal lines and a pair of display signal lines defining a first region, an upper one of the pair of sub scanning signal lines and a lower one of a next pair of sub scanning signal lines and the pair of display signal lines, defining a second region which is wider than said first region;

a plurality of pixel electrodes being arranged within the second regions, the two pixel electrodes disposed within of the second regions;

a plurality of switching devices respectively corresponding to the second regions, each of the switching devices being connected to a corresponding one of the display signal lines and a corresponding one of the pixel electrodes; and

a plurality of common electrodes respectively disposed within the corresponding one of the second regions such that each common electrode is shared by the two pixel electrodes in each second region so as to face the corresponding two pixel electrodes in the corresponding second region, the common electrodes being driven independently from the plurality of scanning signal lines and the plurality of display signal lines wherein each common electrode is in the form of an H character, and the common electrode overlaps along periphery portions of the corresponding two pixel electrodes except for periphery portions thereof respectively connected to the corresponding switching device, for forming a storage capacitance type capacitor therebetween.

6,040,883

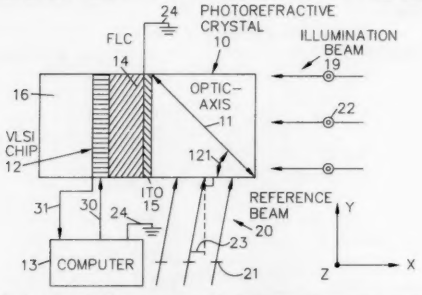
PROGRAMMABLE HOLOGRAM GENERATOR

Kristina M. Johnson, Longmont, and Chong Chang Mao, Louisville, both of Colo., assignors to University Technology Corporation, Boulder, Colo.

Provisional application No. 60/009,652, Jan. 4, 1996. This application Jan. 3, 1997, Appl. No. 775,952.

Int. Cl.[7] G02F *1/133;1/13*

U.S. Cl. 349—116 **25 Claims**



1. An electrically programmable hologram generator, comprising:

a pixelated semiconductor device having a plurality of metallic pads physically arranged to define a pad pixel pattern, each of said metallic pads being electrically conductive;

a liquid crystal having a first and a second surface, said first surface being in physical engagement with said metallic pads, and said metallic pads defining a corresponding liquid crystal pixel pattern for said liquid crystal;

individual pixels within said liquid crystal pixel pattern being switchable to one of two states as a result of a control voltage applied thereto;

an electrically conductive film in physical engagement with said second surface of said liquid crystal, wherein said electrically conductive film is beam transparent;

electrical control means, coupled to said metallic pads, to apply said control voltage between selected ones of said plurality of metallic pads and said electrically conductive film, and operable to switch corresponding selected ones of said individual pixels of said liquid crystal in accordance with an electrical input data; and

a photorefractive crystal, physically associated with said electrically conductive film, for receiving a reference beam of a first characteristic, an illumination beam of a second characteristic, and a reflected illumination beam of a third characteristic, wherein said reflected illumination beam interferes with said reference beam to write a hologram into said photorefractive crystal.

6,040,884

LIQUID CRYSTAL DEVICES COMPRISING A MULTITUDE OF DOMAINS HAVING DIFFERENT THRESHOLD VOLTAGES FOR SWITCHING LIQUID CRYSTALS

Akio Yasuda; Keiichi Nito, both of Tokyo; Eriko Matsui; Hidehiko Takanashi, both of Kanagawa, and Yang Ying Bao, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

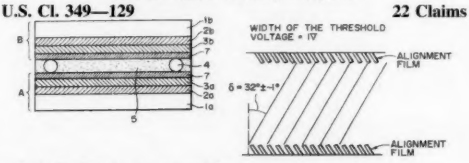
Continuation of application No. 08/139,908, Oct. 22, 1993, Pat. No. 5,654,784. This application Jul. 25, 1997, Appl. No. 900,933.

Claims priority, application Japan, Oct. 24, 1992, 4-309238; Oct. 24, 1992, 4-309239; Nov. 26, 1992, 4-341719; Aug. 31, 1993, 5-239873; Sep. 27, 1993, 5-262951

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G02F *1/1337;1/141;1/13*

U.S. Cl. 349—129 **22 Claims**



1. A display device comprising:

a substrate;

liquid crystal material located above the substrate an alignment film formed between the liquid crystal and the substrate, a further film formed on the alignment film, said further film selected from the group consisting of charge transfer complexes, organic conductive compounds, metals, oxides, and fluorides;

said liquid crystal comprising fine particles and fine domains having threshold voltages which vary over a range of voltages.

6. A display device comprising:

a substrate;

liquid crystal material located above the substrate;

said liquid crystal comprising fine particles and fine domains having threshold voltages which vary over a range of voltages, wherein the number of domains having a size larger than 2 μmϕ in a field of 1 mm^2 is not less than 300.

8. A display device comprising:

a substrate;

liquid crystal material located above the substrate;

said liquid crystal comprising fine particles and fine domains having threshold voltages which vary over a range of voltages, wherein a width of the threshold voltages within the domains is not smaller than 2 volts within a transmittance range of from 10 to 90%.

6,040,885

LIQUID CRYSTAL DISPLAY WITH THREE DOMAINS WHEREIN MOLECULES IN THE THIRD DOMAIN ARE SUBSTANTIALLY VERTICALLY ALIGNED REGARDLESS OF VOLTAGE APPLICATION

Yoshio Koike, Atsugi; Katsufumi Ohmuro, Zama; Takahiro Sasaki, Atsugi, and Arihiro Takeda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 11, 1997, Appl. No. 927,510

Claims priority, application Japan, Sep. 19, 1996, 8-247623

Int. Cl.[7] G02F *1/1337*

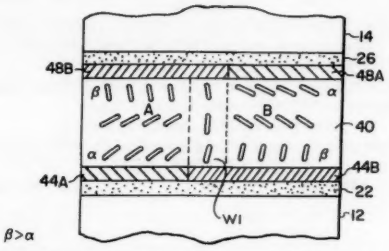
U.S. Cl. 349—129 **26 Claims**

1. A liquid crystal display device having at least one pixel comprising:

first and second opposing substrates having inner surfaces facing each other;

electrodes arranged on each of the inner surfaces of said substrates;

liquid crystal having a negative dielectric an isotropy sealed in a gap between said substrates, said liquid crystal being con-



trolled by a voltage applied thereto via said electrodes, molecules in said liquid crystal being aligned substantially vertically when applied with substantially no voltage thereto, a majority of said molecules being aligned so as to tilt towards one of said substrates when the voltage is applied thereto, said liquid crystal having first, second, and third domains within a single pixel, the first and second domains being separated by the third domain, wherein molecules of said liquid crystal in the third domain are substantially vertically aligned regardless of whether or not voltage is applied thereto via said electrodes; and

first and second alignment films arranged on the corresponding inner surfaces said first and second substrates having said electrodes thereon, respectively, each of said alignment films having a first region and a second region within the single pixel, and the first and second regions of at least said first alignment film adjoining directly to each other along a boundary therebetween, wherein a pre-tilt angle of the molecules of said liquid crystal on each of the first regions is larger than a pre-tilt angle of the molecules of said liquid crystal on each of the second regions of said alignment films, and the first and second domains are disposed on the first and second regions, respectively, and at least a part of the third domain is disposed on a marginal portion of the first region adjoining to the boundary between the first and second regions of said first alignment film.

6,040,886

ACTIVE MATRIX TYPE LCD WITH TWO SHIELD ELECTRODES

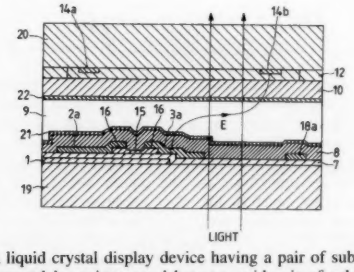
Masuyuki Ota, Katsuta; Genshiro Kawachi, Hitachi; Masaaki Kitajima, Hitachioota; Tohru Sasaki; Masahito Oh-e, both of Hitachi; Katsumi Kondo, Katsuta, and Makoto Tsumura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application No. 08/374,531, Jan. 13, 1995, Pat. No. 5,786,876. This application Jul. 27, 1998, Appl. No. 122,781.

Claims priority, application Japan, Mar. 17, 1994, 6-46916

Int. Cl.[7] G02F *1/1333;1/1343*

U.S. Cl. 349—141 **1 Claim**



1. A liquid crystal display device having a pair of substrates, a liquid crystal layer interposed between said pair of substrates, a plurality of scanning electrodes formed on one substrate of said pair of substrates, a plurality of signal electrodes formed so as to cross the plurality of scanning electrodes, a plurality of transistors each formed at a position corresponding to each of the crossing points of the scanning and signal electrodes, a plurality of pixel electrodes each connected to each of the plurality of transistors, and a plurality of common electrodes formed on one substrate of said pair of substrates, for generating an electric field having a component predominantly in parallel with one of said pair of substrates between the plurality of pixel electrodes;

wherein a plurality of pixels are formed on a region surrounded by a said plurality of scanning electrodes and said plurality of signal electrodes; and

wherein first and second shield electrodes are provided in each of the plurality of pixels, formed among adjacent signal and pixel electrodes and the other substrate of said pair of substrates.

6,040,887

LIQUID CRYSTAL DISPLAY DEVICE WITH WIDE VIEWING ANGLE CHARACTERISTICS COMPRISING HIGH RESISTIVITY BLACK MATRIX

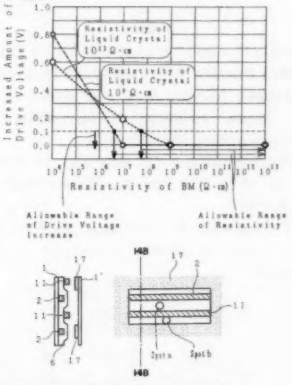
Shigeru Matsuyama; Hiroaki Asuma; Masato Shimura; Yoshifumi Tomita, all of Mobara, and Sukekazu Aratani, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application No. 08/659,650, Jun. 6, 1996, Pat. No. 5,831,701. This application Oct. 28, 1998, Appl. No. 181,039.

Claims priority, application Japan, Jun. 14, 1995, 7-147720; Jul. 27, 1995, 7-191994; Jul. 27, 1995, 7-192004

Int. Cl.[7] G02F *1/1335;1/1393;1/136*

U.S. Cl. 349—141 **22 Claims**



1. A liquid crystal display device comprising:

a pair of substrates at least one of which is transparent;

a black mask formed on one of said pair of substrates and having an opening which has at least one pair of edges confronting each other and extending in a first direction;

a first group of electrodes and a second group of electrodes being formed on at least one of said pair of substrates, extending in the first direction of said one pair of edges of said opening of said black mask and one of said first group of electrodes being disposed alternately with one of said second group of electrodes;

a liquid crystal layer comprising a liquid crystal composition substance having a dielectric anisotropy and held between said pair of substrates;

an orientation control film formed between said liquid crystal layer and one of said pair of substrates for orienting liquid crystal molecules of said liquid crystal composition substance in a predetermined direction;

a polarizing means laminated on at least one of said pair of substrates; and

a drive means for applying a drive voltage to at least one of said first group of electrodes and said second group of electrodes;

at least one of said first group of electrodes and at least one of said second group of electrodes are spaced from each other so as to divide a region enclosed by said opening of said black mask into a pair of first regions and at least one second region and to generate an electric field having a component predominantly in parallel with the interface between said orientation control film and said liquid crystal layer in each of said pair of first regions and said at least one second region, said pair of first regions and said at least one second region extending in the first direction of said one pair of edges of said opening of said black mask;

one of said pair of first regions being disposed adjacent to one of said one pair of edges of said opening of said black mask and another of said pair of first regions being disposed adjacent to another of said one pair of edges of said opening of said black mask;

said at least one second region being spaced from both of said one pair of edges of said opening of said black mask by each of said of first regions, respectively,

said liquid crystal composition substance has a resistivity of not smaller than 10^N Ω·cm, and

said black mask has a resistivity of not smaller than 10^M Ω·cm,

wherein N and M are integers satisfying the relationships N≧9 and M≧6.

6,040,888

POSITIONING OF POSTS IN LIQUID CRYSTAL VALVES FOR A PROJECTION DISPLAY DEVICE

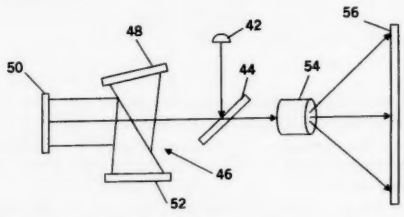
Shinohara Masami; Mitsuru Uda, and Kunio Enami, all of Shiga-ken, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/JP95/01031, § 371 Date Nov. 14, 1997, § 102(e) Date Nov. 14, 1997, PCT Pub. No. WO96/38755, PCT Pub. Date Dec. 5, 1996

PCT Filed May 29, 1995, Appl. No. 973,734

Int. Cl.[7] G02F *1/1339;1/1335*

U.S. Cl. 349—155 **16 Claims**



1. A liquid crystal display device comprising three separate liquid crystal light valves for projecting on a screen images corresponding to red, green and blue each light valve having a plurality of pillar-shaped spacers formed in a pixel array region for maintaining a prescribed cell gap, wherein,

said pillar-shaped spacers are positioned in the pixel array region in each of said three liquid crystal light valves at locations where at least a part of shadows cast by the pillar-shaped spacers do not overlap with each other in projected images produced by the three valves when they are superimposed on one another on the screen.

6,040,889

LIQUID CRYSTAL DISPLAY WITH CONTINUOUS GRAYSCALE, WIDE VIEWING ANGLE, AND EXCEPTIONAL SHOCK RESISTANCE

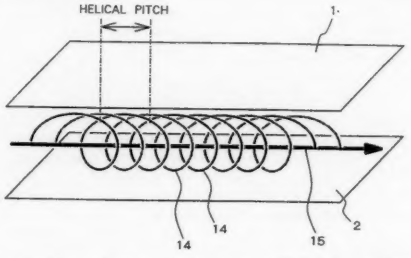
Ken-Ichi Takatori, and Ken Sumiyoshi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1997, Appl. No. 997,232

Claims priority, application Japan, Dec. 25, 1996, 8-345168

Int. Cl.[7] C09K *19/02*

U.S. Cl. 349—174 **16 Claims**



1. A liquid crystal display device comprising a pair of substrates; and

a liquid crystal material having an antiferroelectric phase sandwiched between said pair of substrates; wherein

at least one of said pair of substrates undergoes an aligning process, and a natural helical pitch of said liquid crystal material is smaller than a gap between the substrates;

wherein the natural helical pitch of said liquid crystal material is smaller than twice a lower-limit wavelength of a wavelength range of light used in said liquid crystal display device.

6,040,890

ELECTRIC OPTICAL LIQUID CRYSTAL SYSTEM

Shinichi Sawada; Shizuo Murata, and Toyoshiro Isoyama, all of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan

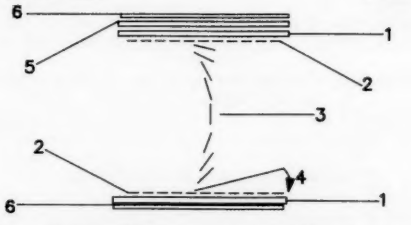
PCT No. PCT/JP96/03559, § 371 Date Jun. 29, 1998, § 102(e) Date Jun. 29, 1998, PCT Pub. No. WO97/24640, PCT Pub. Date Jul. 10, 1997

PCT Filed Dec. 4, 1996, Appl. No. 101,021

Claims priority, application Japan, Dec. 27, 1995, 7-353704

Int. Cl.[7] C09K *19/52*

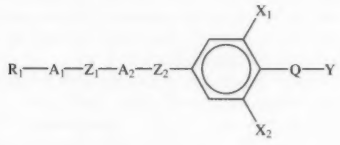
U.S. Cl. 349—182 **17 Claims**



1. In an electric optical system, wherein outsides of transparent upper and lower substrates in a bend cell are placed crossnicolly between at least one birefringent film and at least two polarized plates, and wherein the substrates facing each other have such a relationship that the pre-tilt direction of liquid crystal molecules layer in one substrate interface and pre-tilt direction of liquid crystal molecules layer in the other substrate interface of the substrates are symmetrical with respect to a plane parallel to the substrates, the improvement wherein the system contains at least one compound selected from the group consisting of liquid crystal compounds and liquid crystalline compounds expressed by the formula 1, and/or a liquid crystal mixture comprising at least one compound selected from the group consisting of liquid crystal

compounds and liquid crystalline compounds expressed by the formulae 2, 3, 4A and 4B, and an oriented membrane made of compounds expressed by the formula 5,

(1)



wherein, in formula 1, R_1 denotes an alkyl or alkoxy with 1 to 8 carbon atoms, an alkoxymethyl or alkoxyethyl group, or an alkenyl group with up to 7 carbon atoms,

Z_1 and Z_2 denote independently from each other $—CH_2CH_2—$, —COO— or a single bond,

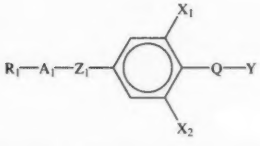
Q is $—CF_2—$, $—OCF_2—$, $OCF_2CFHCF_2—$ or a single bond,

Y denotes H, F, Cl or an alkyl group optionally substituted with F atoms(s),

X_1 and X_2 are H, Cl or F, and

A_1 and A_2 are independently from each other trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, 3,5-difluoro-1,4-phenylene, pyrimidine-2,5-diyl or pyridine-2,5-diyl,

(2)



wherein, in formula 2, R_1 is alkyl, alkoxy or alkoxyalkyl with 1 to 8 carbon atoms,

Z_1 denotes $—CH_2CH_2—$, —COO— or a single bond,

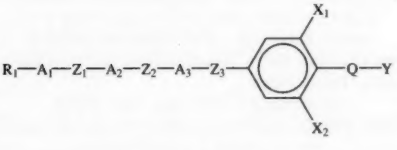
Q is $—CF_2—$, $—OCF_2—$ or a single bond,

Y denotes H, F, Cl or an alkyl group optionally substituted with F atom(s),

X_1 and X_2 are H, Cl or F, and

A_1 is trans-1,4-cyclohexylene, 1,4 phenylene, 2-fluoro-1,4-phenylene, 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, 3,5-difluoro-1,4-phenylene, pyrimidine-2,5-diyl or pyridine-2,5-diyl,

(3)



wherein, in formula 3, R_1 is an alkyl group with 1 to 8 carbon atoms,

Z_1, Z_2 and Z_3 denote independently from each other $—CH_2CH_2—$, —COO— or a single bond,

Q is $—CF_2—$, $—OCF_2—$ or a single bond,

Y denotes H, F, Cl or an alkyl group optionally substituted with F atom(s),

X_1 and X_2 are H, Cl or F, and

A_1, A_2 and A_3 are independently from each other trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, 3-fluoro-1,4-phenylene, 2,3-difluoro-1,4-phenylene, 3,5-difluoro-1,4-phenylene, pyrimidine-2,5-diyl or pyridine-2,5-diyl,

R_1-L-E-R_2 (4A)

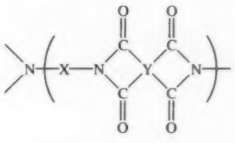
R_1-L-CH_2CH_2-E-R_2 (4B)

wherein, in formulae 4A and 4B, L and E denote independently from each other -Phe-, -Cyc-, -Phe-Phe-, -Phe-Cyc-, -Cyc-Cyc-, -Pyr-, -G-Phe-, -G-Cyc- and enantiomers, wherein -Phe- denotes 1,4-phenylene optionally substituted with F atom(s), -Cyc-denotes trans-1,4-cyclohexylene or trans-1,4-cyclohexenylene, -Pyr-denotes pyrimidine-2,5-diyl or pyridine-2,5-diyl, -G- denotes 2-(trans-1,4-cyclohexyl) ethyl, pyrimidine-2,5-diyl or pyridine-2,5-diyl,

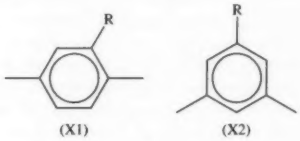
one of substituents L and E is -Phe-, -Cyc-, -Pyr- or -Phe-Cyc-, and

R_1 and R_2 are independently from each other alkyl, alkenyl, alkoxy, alkenyloxy or alkanoyloxy with up to 8 carbon atoms,

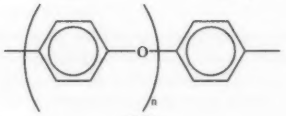
(5)



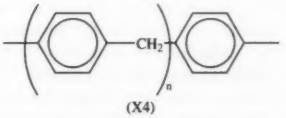
wherein X represents a group from formulae X1 to X8, and Y represents a group from formulae Y1 to Y8,



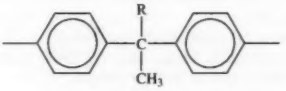
(X1) (X2)



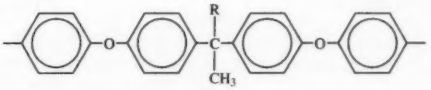
(X3)



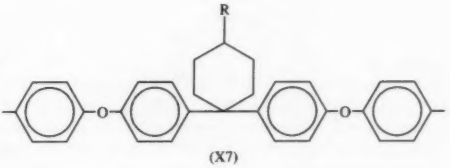
(X4)



(X5)



(X6)



(X7)

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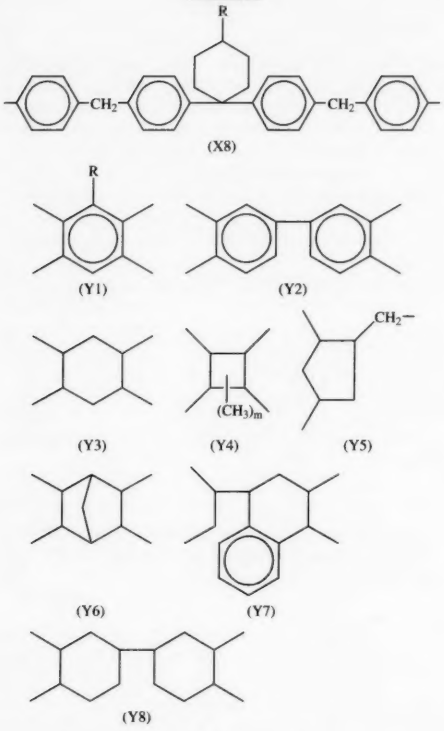


wherein in formulae X1 to X8, R represents H or an alkyl group with 1 to 10 carbon atoms, and n represents a real number of 1 to 3, and in formulae Y1 to Y8, R represents H or an alkyl group with 1 to 10 carbon atoms, and m represents a real number of 1 to 4.

6,040,891

PHOTOGRAPHIC PRINTING APPARATUS

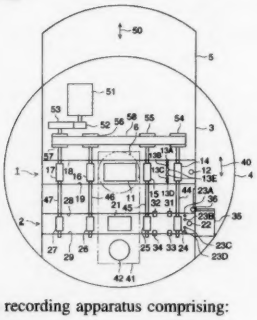
Masanori Makino; Hirotake Mochizuki; Takao Misawa, and Takao Tsuda, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 12, 1998, Appl. No. 75,864

Claims priority, application Japan, May 14, 1997, 9-124037; May 16, 1997, 9-126873; Jun. 6, 1997, 9-149283

Int. Cl.[7] G03B *27/52;27/62*

U.S. Cl. 355—46 **32 Claims**



1. An image recording apparatus comprising:

a film loading section on which a first film or a second film having a width which differs from that of the first film can be loaded;

a printing section distant from the film loading section;

detecting means for detecting a film width of the loaded film on the film loading section and for outputting detection signals;

conveyance means for conveying said loaded film from the film loading section to the printing section;

conveyance control means for controlling said conveyance means in accordance with said detection signals; and

a light source to irradiate the loaded film at the printing section, thereby projecting light corresponding to an image formed on the loaded film onto a light-sensitive material.

6,040,892

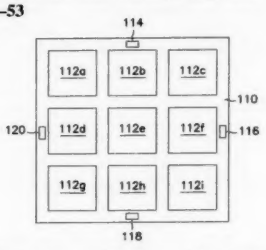
MULTIPLE IMAGE RETICLE FOR FORMING LAYERS

Christophe Pierrat, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Aug. 19, 1997, Appl. No. 914,417

Int. Cl.[7] G03B *27/42;* **G03F** *9/00*

U.S. Cl. 355—53 **18 Claims**



1. A reticle for use in controllably exposing a wafer with desired patterns, comprising:

a substrate;

a plurality of spaced apart independent images of different patterns of a single integrated circuit die on the substrate,

least some of the patterns rendering different processing levels of the single integrated circuit die, and

all of the patterns being oriented in a single direction with respect to the integrated circuit die.

6,040,893

SCANNING EXPOSURE METHOD AND APPARATUS FOR CONTROLLING ACCELERATION AND DECELERATION OF A MASKING DEVICE

Ryuichi Ebinuma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1997, Appl. No. 935,902

Claims priority, application Japan, Sep. 25, 1996, 8-272886

Int. Cl.[7] G03B *27/42;27/54;27/72*

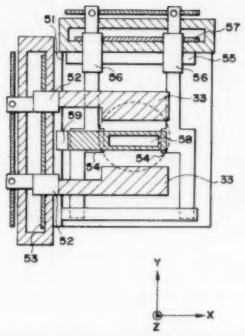
U.S. Cl. 355—53 **4 Claims**

1. A scanning exposure apparatus for projecting a portion of a pattern of an original onto a substrate in a slit-like shape through a projection optical system and for scanningly moving the original and the substrate perpendicular to an optical axis of said projection optical system, to thereby print the pattern of the original on the substrate, said apparatus comprising:

masking means for restricting an exposure area on the original;

driving means for moving said masking means in accordance with a scan of the original and the substrate; and

control means for controlling said driving means so that acceleration of said masking means is completed (i) before a start of the exposure and (ii) after completion of acceleration of



one of the original and the substrate for scan exposure, and for initiating deceleration of said masking means after completion of the exposure.

6,040,894

PROJECTION EXPOSURE APPARATUS AND DEVICE MANUFACTURING METHOD

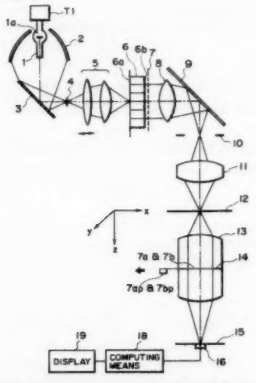
Kazuhiro Takahashi, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1997, Appl. No. 959,301

Claims priority, application Japan, Oct. 29, 1996, 8-303902

Int. Cl.[7] **G03B** *27/42;27/54*

U.S. Cl. 355—53 **4 Claims**



1. A projection exposure apparatus, comprising:

an illumination optical system for illuminating a mask with light from a light source;

a projection optical system for projecting an image of a pattern of the mask being illuminated, said projection optical system having a pupil plane;

a holding member for holding a substrate for receiving the image of the pattern;

a light detector for receiving light from the light source, passed through said projection optical system;

stop means, disposed adjacent to at least one of the pupil plane and a plane optically conjugate with the pupil plane, having a variable aperture for selectively passing light, wherein said light detector performs light detection a plurality of times while the aperture of said stop means is changed;

determining means for determining a light intensity distribution upon the pupil plane based on outputs of said light detector corresponding to the plural light detections; and

adjusting means for adjusting the light intensity distribution on the pupil plane as desired by adjusting a position of the light source based on the determined light intensity distribution.

6,040,895

METHOD AND DEVICE FOR CONTROLLED ILLUMINATION OF AN OBJECT FOR IMPROVING IDENTIFICATION OF AN OBJECT FEATURE IN AN IMAGE OF THE OBJECT

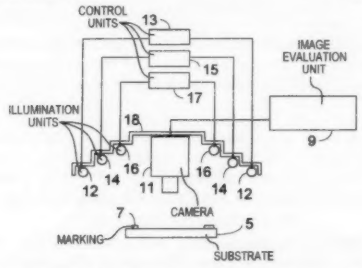
Gerhard Haas, Oberschleissheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 29, 1998, Appl. No. 69,283

Claims priority, application Germany, Oct. 8, 1997, 197 44 454

Int. Cl.[7] **G03B** *27/54;* **G01B** *11/00;* **H04N** *7/18*

U.S. Cl. 355—70 **10 Claims**



6. An apparatus for optimally illuminating a group of objects having substantially identical object features, comprising:

a camera having a field of view;

means for placing a first object of a group of objects in said field of view of said camera, said camera obtaining an image of said first object, said first object having an object feature and said object feature being present in said image;

means for illuminating said first object while said first object is in the field of view of said camera, with illuminating light formed by emitted light from a plurality of illumination sources, the emitted light from each illumination source having a spectral distribution;

a plurality of control devices respectively connected to said illumination sources and controlling said illumination sources by varying parameters of said control devices to vary the spectral distribution of the emitted light from each of said illumination sources until an optimized illumination of said first object by said illuminating light is achieved at which said object feature is reliably recognizable in said image;

means for storing said parameters which produce an optimized illumination of said first object as stored parameters; and

means for setting said control devices with said stored parameters for illuminating all other objects in said group.

6,040,896

METHOD OF PRINTING PHOTOSENSITIVE MATERIAL

Eiji Motooka, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

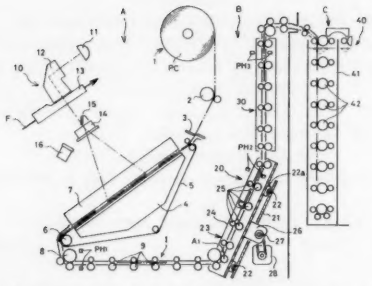
Filed Oct. 11, 1995, Appl. No. 541,099

Claims priority, application Japan, Oct. 14, 1994, 6-249540

Int. Cl.[7] **G03B** *27/58;29/00;27/54*

U.S. Cl. 355—72 **12 Claims**

1. A method of transferring images recorded on films onto sheets of photosensitive material by photoprinting, said method comprising the steps of feeding a web of photosensitive material from a supply unit to a cutter, cutting said web of photosensitive paper into a plurality of sheets, and feeding said sheets onto an exposure table for photoprinting, wherein if said sheets can be placed on said exposure table by a predetermined number which is not one at a



time, said sheets are fed onto said exposure table so as to print one of said sheets and cut another one of said sheets simultaneously while discharging still another one of said sheets.

6,040,897

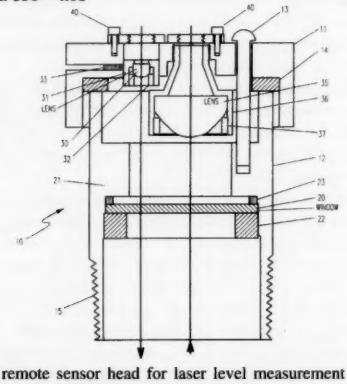
REMOTE SENSOR HEAD FOR LASER LEVEL MEASUREMENT DEVICES

Bruce Clifford, Ontario, Canada, and John Harrison, Shalimar, Fla., assignors to Laser Technology, Inc., Englewood, Colo.

Filed Apr. 29, 1998, Appl. No. 69,447

Int. Cl.[7] G01C *3/08;* **G01F** *23/00*

U.S. Cl. 356—4.01 **9 Claims**



1. A remote sensor head for laser level measurement in liquid storage vessels, said sensor head comprising:

a sleeve, said sleeve generally cylindrical in shape, with a component end opposite a connecting end, said sleeve being hollow throughout providing fluid connectivity between said component end and said connecting end and forming a sleeve interior cavity;

a base, said base generally cylindrical in shape with a cable end opposite a component end, said base being hollow on said component end and forming a base interior cavity, said base connected to said sleeve at said component end by a plurality of leveling screws such that the longitudinal axis of said base is parallel to the longitudinal axis of said sleeve and such that said base interior cavity is in fluid communication with said sleeve interior cavity;

a transmitter lens assembly, said transmitter lens assembly having a generally cylindrical shape, said transmitter lens assembly being hollow throughout with a transmitter lens assembly cable end in fluid communication with a transmitter lens assembly component end, said transmitter lens assembly secured to said base interior cavity in a manner such that the longitudinal axis of said transmitter lens assembly is parallel to the longitudinal axis of said sleeve and said base and such that said transmitter lens assembly component end is in fluid communication with said sleeve interior cavity and said base interior cavity;

a receiver lens assembly, said receiver lens assembly being generally cylindrical in shape and hollow throughout with a receiver lens assembly cable end in fluid communication with a receiver lens assembly component end, said receiver lens assembly secured to said base interior cavity in a manner such that the longitudinal axis of said receiver lens assembly is parallel to the longitudinal axis of said sleeve and said base and such that said receiver lens assembly component end is in fluid communication with said sleeve interior cavity and said base interior cavity;

a window, said window affixed perpendicular to the longitudinal axis of said sleeve interior cavity and spanning the interior cross-section of said sleeve and secured by a window retaining ring;

a transmitter lens, said transmitter lens affixed in said transmitter lens assembly perpendicular to the longitudinal axis of said transmitter lens assembly and secured by a transmitter lens retaining ring; and

a receiver lens, said receiver lens affixed in said receiver lens assembly perpendicular to the longitudinal axis of said receiver lens assembly and secured by a receiver lens retaining ring.

6,040,898

FMCW DISTANCE MEASUREMENT PROCESS

Jan Michael Mrosik, Thalkirchner Strasse 47d, D-80337 München; Joerg Nagel, Hubertusstr. 154, D-47798 Krefeld, and Christo G. Stojanoff, Eirendorfer Str. 130, D-52078 Aachen, all of Germany

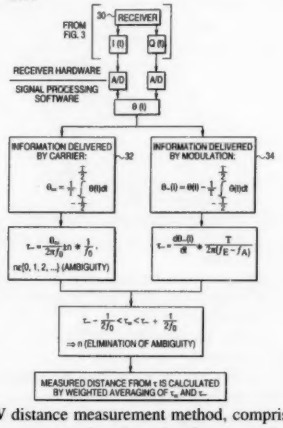
PCT No. PCT/EP96/02636, § 371 Date Dec. 22, 1997, § 102(e) Date Dec. 22, 1997, PCT Pub. No. WO97/01107, PCT Pub. Date Jan. 9, 1997

PCT Filed Jun. 19, 1996, Appl. No. 981,291

Claims priority, application Germany, Jun. 20, 1995, 195 21 771

Int. Cl.[7] G01C *3/08;* **G01S** *13/08*

U.S. Cl. 356—5.09 **11 Claims**



1. A FMCW distance measurement method, comprising:

modulating a wave train of carrier frequency f_0 by a time function f(t) and splitting said wave train into a transmission signal and a reference signal in a deterministic phase relationship;

putting the transmission signal onto a transmission link to be measured and feeding the reference signal to a phase difference-forming arrangement;

feeding a signal reflected in the transmission link and delayed by the propagation time τ as a reception signal to the phase difference-forming arrangement;

wherein the phase difference-forming arrangement forms the time difference function $\theta(t)$ of the phases between the reference and reception signals;

evaluating the phase difference function $\theta(t)$ separately with respect to a direct component $\theta_{=}=g'(\tau, f_0)$ assigned to the carrier frequency f_0 and with respect to an alternating component $\theta_{\sim}(t)=g''(\tau, f_{\sim}(t))$ assigned to the modulation time function f(t); and

determining the propagation time τ proportional to the distance by a combined evaluation of said direct component and said alternating component of the phase difference function.

6,040,899

OPTICAL VELOCIMETRIC PROBE

Jean-Marc Breda, Vendome, France, assignor to Sextant Avionique, Velizy Villacoublay, France

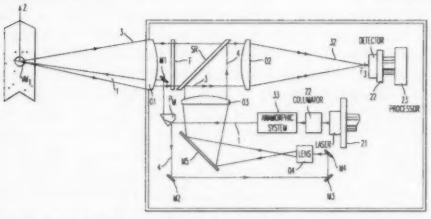
PCT No. PCT/FR97/01122, § 371 Date Feb. 25, 1998, § 102(e) Date Feb. 25, 1998, PCT Pub. No. WO97/50004, PCT Pub. Date Dec. 31, 1997

PCT Filed Jun. 24, 1997, Appl. No. 11,754

Claims priority, application France, Jun. 25, 1996, 96 07857

Int. Cl.[7] G01P *3/36*

U.S. Cl. 356—28.5 **12 Claims**



1. An optical velocimetric probe configured to measure particles in relative motion with respect to the probe, said probe comprising:

an illuminating device configured to illuminate, with a first light beam, a measurement volume through which said particles pass, wherein said illuminating device includes a focusing means configured to focus said first light beam on said measurement volume;

means for optical detection of a second light beam which includes a third light beam back scattered by the particles in order to produce an electric signal in response to the passage of one of said particles through the measurement volume;

a device configured to provide a reference light beam from said first light beam;

a device configured to produce interference between said reference light beam and said third light beam wherein said interference is contained in said second light beam, wherein a wavefront of the third light beam and a wavefront of the reference light beam are planar and have substantially identical geometries when interfering.

6,040,900

COMPACT FIBER-OPTIC ELECTRONIC LASER SPECKLE PATTERN SHEAROGRAPHY

Xiaolu Chen, Saline, Mich., assignor to Cybernet Systems Corporation, Ann Arbor, Mich.

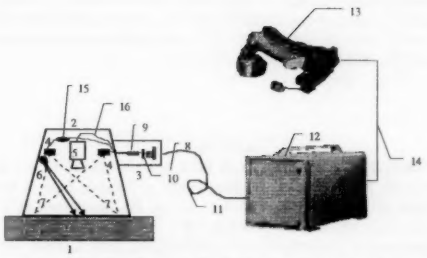
Provisional application No. 60/020,750, Jul. 1, 1996. This application Jul. 1, 1997, Appl. No. 886,317.

Int. Cl.[7] G01B *9/02*

U.S. Cl. 356—35.5 **8 Claims**

1. A system for detecting defects and damage in an object, comprising:

a thermal stressing unit operative to provide a slight temperature differential between a localized region and a surrounding area of the object;



two coherent laser beams directed toward the object, enabling the objects to interfere with one another within the localized region;

electronic shearography optics having a field of view which includes the localized region, the optics being operative to measure the derivative of out-of-plane displacement with respect to an image shearing direction so as to generate a fringe pattern characteristic of flaw-induced anomalies; and

a display device, operatively coupled to the electronic shearography optics, upon which to view the fringe pattern.

6,040,901

DEVICE FOR OPTICALLY DETECTING SHEET MATERIAL

Michael Stapfer, and Michael Fiedler, both of Munich, Germany, assignors to Giesecke & Devrient GmbH, Munich, Germany

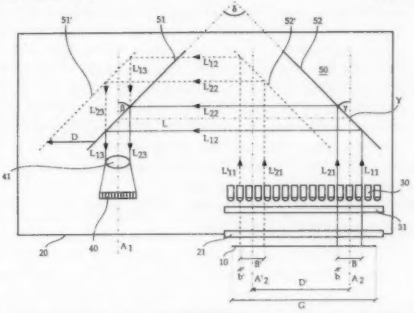
PCT No. PCT/EP98/01484, § 371 Date Jan. 5, 1997, § 102(e) Date Jan. 5, 1997, PCT Pub. No. WO98/41955, PCT Pub. Date Sep. 24, 1998

PCT Filed Mar. 13, 1998, Appl. No. 147,257

Claims priority, application Germany, Mar. 14, 1997, 197 10 621

Int. Cl.[7] G06K *9/74*

U.S. Cl. 356—71 **6 Claims**



1. An apparatus for optical detection of sheet material, for example bank notes, having

a detection device (**40**, **41**) for detecting the light of an area (B) of the sheet material (**10**) incident from the direction of an optical detector axis (A_1) and emitted by the sheet material (**10**) in the direction of an optical sheet material axis (A_2, A'_2),

an illumination device (**30**, **31**) for illuminating at least the area (B) of the sheet material (**10**),

characterized in that

a reflection device (**50**) with reflectors (**51**, **52**) is provided for deflecting the light emitted by the area (B) of the sheet material (**10**) in the direction of the sheet material axis in the direction of the detector axis,

an adjusting device is provided for changing the position of at least two reflectors (**51**, **52**) for fixing the position of the area (B) on the sheet material (**10**) relative to the detection device (**40**, **41**), and

the reflectors (**51**, **52**) are disposed so that the length (L) of the optical path of the emitted light from the sheet material (**10**) to the detector device (**40**, **41**) is independent of the position of the area (B) on the sheet material.

6,040,902

APPARATUS AND METHOD FOR MEASURING COLOR

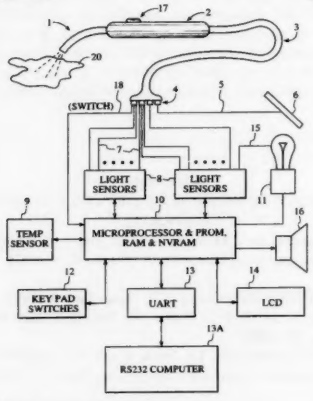
Wayne D. Jung; Russell W. Jung, both of Morton Grove, and Alan R. Loudermilk, Chicago, all of Ill., assignors to LJ Laboratories, L.L.C., Chicago, Ill.

Continuation of application No. 08/581,851, Jan. 2, 1996, Pat. No. 5,745,229. This application Aug. 12, 1997, Appl. No. 909,666.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G01B** *11/30;* **G01J** *3/51;* **G01N** *21/64;21/47*

U.S. Cl. 356—73 **379 Claims**



1. A method, comprising the steps of:

positioning a probe in proximity to an object, wherein the probe provides light to a surface of the object from one or more light sources, and receives light from the object through a plurality of light receivers, wherein one or more of the light receivers are coupled to one or more first optical sensors for generating data indicative of spectral characteristics of the object, and wherein one or more of the light receivers are coupled to one or more second optical sensors for generating data indicative of translucence characteristics of the object;

taking a plurality of first and second measurements with the first and second optical sensors; and

determining optical characteristics of the object based on the first and second measurements.

6,040,903

ELECTRO-OPTICAL MEASURING DEVICE FOR DETERMINING THE RELATIVE POSITION OF TWO BODIES, OR OF TWO SURFACE AREAS OF BODIES, IN RELATION TO EACH OTHER

Heinrich Lysen, Garching; Kal Aschenbrenner, Goldach, and Thomas Letze, Oberschlielssheim, all of Germany, assignors to Prüftechnik Dieter Busch AG

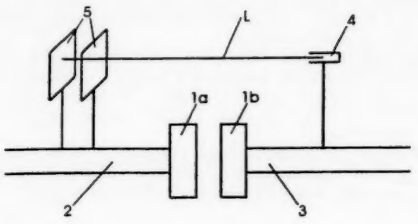
PCT No. PCT/EP97/00274, § 371 Date Sep. 22, 1998, § 102(e) Date Sep. 22, 1998, PCT Pub. No. WO98/33039, PCT Pub. Date Jul. 30, 1998

PCT Filed Jan. 22, 1997, Appl. No. 142,174

Int. Cl.[7] **G01N** *21/86;* **G01B** *5/25*

U.S. Cl. 356—153 **7 Claims**

1. Electro-optical measuring instrument for detecting the relative position assumed by at least surface regions of two bodies with respect to one another, having a measuring arrangement which has



at least one light beam transmitter and at least one optoelectronic position detector with a light-sensitive measuring surfaces wherein:

a) the light beam transmitter is arranged in a path fixed with respect to at least the surface region at least one of the two bodies in a manner for directing a focused light beam of small divergence onto the light-sensitive measuring surface of the position detector, and the position detector supplying electric signals corresponding to coordinates of the instantaneous point of impingement of the light beam on the measuring surface in response to impingement of said light beam thereon, and

b) at least parts of the measuring arrangement are configured to be displaceable in a defined measuring movement with the surface region of one of the two bodies in such a way that a geometrical locus, produced in the course of the measuring movement, of the points of impingement of the light beam on the measuring surface is in a predetermined relationship to the relative position of the at least surface regions of the two bodies to be determined, the measuring instrument having means for calculating, under programmed control, the relative position to be detected on the basis of the electric signals as supplied by the position detector during the measuring movement and further comprising a device which carries an extension of the measuring region while monitoring the measuring movement.

6,040,904

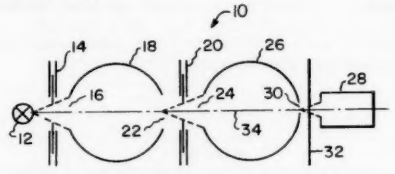
DIFFUSE OPTICAL TRANSMISSION DENSITY MEASUREMENT SYSTEM

Eric L. Fallet, Pittsford; Michael R. Goodwin, Rochester, and Timothy P. Hahm, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1998, Appl. No. 219,691

Int. Cl.[7] **G01J** *1/04*

U.S. Cl. 356—236 **11 Claims**



1. An apparatus for measuring diffuse optical transmission density of a film sample comprising:

(a) a diffuse light source:

(b) a first light modulation system through which light from said light source is transmitted to a first optical diffuser;

(c) a second light modulation system positioned between said first optical diffuser and a second optical diffuser;

(d) a detector system which receives light from an exit port of said second optical diffuser and through said second light modulation system; and

(e) means for supporting the film sample between said exit port of said second optical diffuser and said detector system.

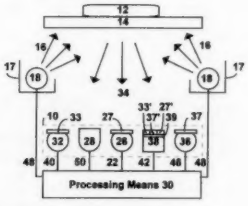
6,040,905
FIBER COLOR GRADING SYSTEM

Luo Cheng; Glenn E. Irick, Sr.; Youe-Tsyr Chu; Hossein M. Ghorashi; Michael E. Galyon, and Mark A. Overbay, all of Knoxville, Tenn., assignors to Zellweger Uster, Inc., N.C.

Filed Aug. 5, 1998, Appl. No. 129,271

Int. Cl.[7] G01N *21/00*

U.S. Cl. 356—238.3 **20 Claims**



1. A fiber classing device comprising:

a sample window for viewing a fiber sample,

a light source for providing light that is directed toward and reflected by the fiber sample, producing reflected light,

a photo sensitive detector positioned to receive the reflected light, for detecting lightness, redness, and yellowness of the fiber sample, and for producing a lightness signal, a redness signal, and a yellowness signal based on the lightness, redness, and yellowness of the fiber sample, and

processing means for (1) receiving the lightness signal, redness signal, and yellowness signal from the photo sensitive detector, (2) assigning a preliminary grade to the fiber sample based at least in part on the lightness signal and yellowness signal, and (3) selectively adjusting the preliminary grade to a final grade based at least in part on the redness signal.

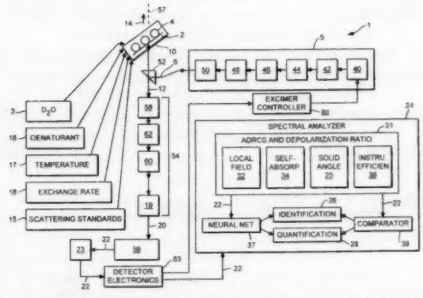
6,040,906
RESONANCE RAMAN SPECTROSCOPY FOR IDENTIFYING AND QUANTITATING BIOMATTER, ORGANIC, AND INORGANIC ANALYTES

Gregory P. Harhay, 26 John St., Chicopee, Mass. 01013

Filed Jul. 11, 1996, Appl. No. 678,649

Int. Cl.[7] G01J *3/44*

U.S. Cl. 356—301 **30 Claims**



1. A method of resonance Raman spectroscopy for identifying and quanitating proton-bearing analytes including bacteria, viruses, prions, biomolecules, biomolecular assemblies, inorganic and organic compounds comprising:

deuterating with dideuterium oxide (D20) a sample containing one or more analytes, each analyte having exchangeable protons such that said deuteration will cause the protons of said analyte to be exchanged with deuterons;

providing a monochromatic light at an excitation frequency onto a sample for producing Raman sample light and rejecting Rayleigh light;

passing said Raman sample light through a depolarizer for producing randomized polarization components of said Raman sample light;

generating a Raman sample spectrum calibrated with respect to an absolute differential Raman cross-section standard in response to said randomized polarization components;

providing said Raman sample spectrum to a spectral analyzer; provides the identity of analytes in the sample.

6,040,907
MICROSCOPE SYSTEM FOR THE DETECTION OF EMISSION DISTRIBUTION AND PROCESS FOR OPERATION OF THE SAME

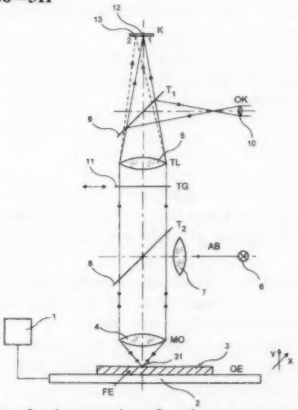
Reinhard Steiner, Stadtroda, and Dieter Graefe, Jena, both of Germany, assignors to Carl Zeiss Jena GmbH, Jena, Germany

Filed Aug. 29, 1997, Appl. No. 920,680

Claims priority, application Germany, Jan. 21, 1997, 197 01 703

Int. Cl.[7] G01J *3/18;3/36*

U.S. Cl. 356—311 **6 Claims**



1. A process for the operation of a microscope system having an imaging beam path from a specimen in a direction of an at least one-dimensional receiver distribution, comprising the steps of:

imaging the specimen to produce a light output from said specimen;

displaying an image representative of said light output by the specimen;

marking one or more points or areas of the displayed image;

providing, after marking of said one or more points or areas, within the imaging beam path an element adapted to spectral divide fight emitted at least in a punctiform manner;

moving the one or more marked points or areas into a predetermined image coordinate of the displayed image; and

receiving a spectrum of light resulting from the spectral division of light by said element.

6,040,908
METHOD FOR STRESS TUNING FIBER OPTIC SENSOR COILS

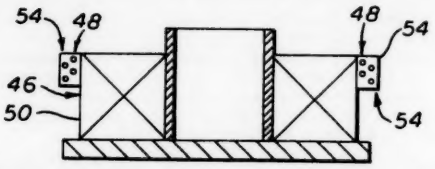
John P. Rahn, West Hills; Ralph A. Patterson, Moorpark, and Amado Cordova, Woodland Hills, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 28, 1998, Appl. No. 123,626

Int. Cl.[7] G01C *19/72*

U.S. Cl. 356—350 **15 Claims**

1. A method for reducing Shupe bias in a fiber optic gyroscope of the type that includes a source of optical energy, a coil pack comprising a potted sensor coil formed of fiber segments wound



clockwise and counterclockwise from the midpoint of said coil, said coil pack being located upon and adjacent to a coil mount, a phase modulator engaged to said coil for imposing an artificial phase shift upon light counterpropagating within said coil and a photodetector for receiving and converting the output of said coil into an electrical signal, said method including the steps of:

a) applying a plurality of temperature ramps to said coil pack; and

b) measuring the output of said coil in response to each of said temperature ramps; then

c) calculating the strain differential between the clockwise and counterclockwise-wound fiber segments; then

d) determining a coil lead profile for imposing a counteracting differential stress; and then

e) attaching fiber leads to the ends of said clockwise and counterclockwise wound fiber segments in accordance with said lead profile.

6,040,909

SURFACE POSITION DETECTING SYSTEM AND DEVICE MANUFACTURING METHOD USING THE SAME

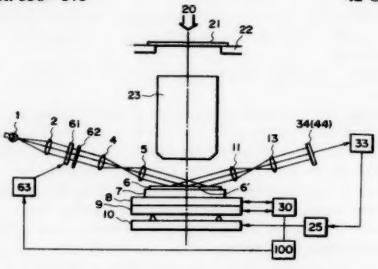
Masanobu Hasegawa, Utsunomiya; Minoru Yoshii, Tokyo, and Yoshinori Ohsaki, Utsunomiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1998, Appl. No. 70,741

Claims priority, application Japan, May 2, 1997, 9-130484; Apr. 25, 1998, 10-131132

Int. Cl.[7] G01B *11/14*

U.S. Cl. 356—375 **42 Claims**



1. A detecting system for detecting positional information related to a surface of an object, said detecting system comprising:

a variable pattern generator for projecting an arbitrary pattern image on the surface of the object;

a light projecting optical system for projecting a pattern, defined by said variable pattern generator, to the surface of the object along an oblique direction;

a light receiving optical system for directing light from an image of the pattern; and

a light receiving element for detecting the light directed by said light receiving optical system, wherein surface position information about the surface of the object is detected on the basis of the detection by said light receiving element.

6,040,910

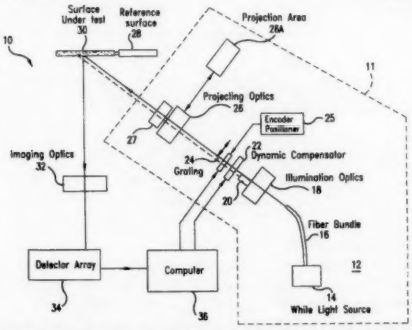
OPTICAL PHASE-SHIFT TRIANGULATION TECHNIQUE (PST) FOR NON-CONTACT SURFACE PROFILING

Shudong Wu, San Francisco, and Guowen Lu, Mountain View, both of Calif., assignors to The Penn State Research Foundation, University Park, Pa.

Filed May 20, 1998, Appl. No. 82,409

Int. Cl.[7] G01B *11/24*

U.S. Cl. 356—376 **16 Claims**



1. An apparatus for profiling a surface of an object comprising:

illumination means for directing an incident beam of light having a varying intensity pattern onto said surface, said illumination means including means for reducing high order harmonics of said varying intensity pattern;

means for selectively adjusting an intensity of a selected point or pixel of said varying intensity pattern from said illumination means;

means for spatially phase shifting the varying intensity pattern of said incident beam of light;

detector means for receiving deformed grating images of said surface; and

processing means, coupled to said detector means, for determining a profile of said surface based on a number of the deformed grating images at different spatial phases, said processing means further controlling said means for selectively adjusting to adjust an intensity of a selected point according to surface reflectivity conditions of said surface.

6,040,911

REFERENCE IMAGE FORMING METHOD AND PATTERN INSPECTION APPARATUS

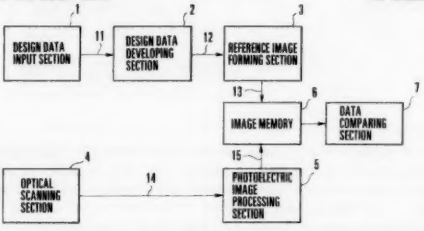
Takeo Nozaki, Tokyo, and Satoshi Nishii, Kanagawa, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1998, Appl. No. 141,364

Claims priority, application Japan, Aug. 29, 1997, 9-234018

Int. Cl.[7] G01B *11/00*

U.S. Cl. 356—394 **18 Claims**



1. A reference image forming method in a pattern inspection apparatus for scanning a pattern formed on an object to be inspected on the basis of design data with a laser beam having a predetermined wavelength, focusing transmitted light passing through the object on a light-receiving element by using an objective lens, forming a real image from pattern information obtained

from said light-receiving element, and comparing the real image with a reference image obtained by imaging the design data, thereby detecting a defect in the object, comprising the steps of:

forming reference data by developing the design data as a pattern made of multilevel gradation values on pixels having a resolution higher than an inspection resolution; and

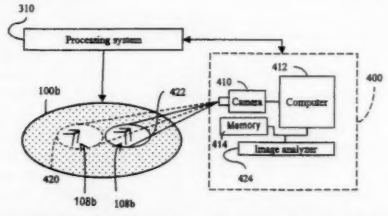
forming a reference image by increasing or decreasing a width of each pattern of the reference data as a multilevel gradation pattern with a precision higher than the inspection resolution on the basis of an edge position of a corresponding pattern in the real image.

6,040,912

METHOD AND APPARATUS FOR DETECTING PROCESS SENSITIVITY TO INTEGRATED CIRCUIT LAYOUT USING WAFER TO WAFER DEFECT INSPECTION DEVICE

Steven J. Zika, Fremont, and C. Bradford Hopper, San Francisco, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 30, 1998, Appl. No. 163,314
Int. Cl.[7] G01B *11/00*
U.S. Cl. 356—394 **11 Claims**



1. A method of detecting random layout structures sensitive to process induced pattern errors in semiconductor device manufacturing, the method comprising the steps of:

applying a first manufacturing process to a first wafer containing semiconductor devices;

applying a second manufacturing process to a second wafer containing semiconductor devices, the second manufacturing process being different from the first manufacturing process;

comparing the first and second wafers by image subtraction to detect systematic pattern defects in the semiconductor devices of one of the first and second wafers.

6,040,913

METHOD TO DETERMINE LIGHT SCATTERING EFFICIENCY OF PIGMENTS

Robert William Johnson, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1999, Appl. No. 240,251
Int. Cl.[7] C10D *8/23*
U.S. Cl. 356—432 **16 Claims**

1. A method to determine light scattering efficiency of a white pigment wherein the light scattering efficiency correlates with performance in an end-use application, comprising:

(a) preparing a dilute slurry of a pigment in a continuous liquid medium having a known concentration, where concentration is the concentration of pigment in the slurry;

(b) measuring the total transmittance (T) of the slurry at a wavelength (λ) of at least 600 nm;

(c) converting the transmittance measurement (T) to optical density (OD) by the equation

$$OD = -\log(T)$$

and

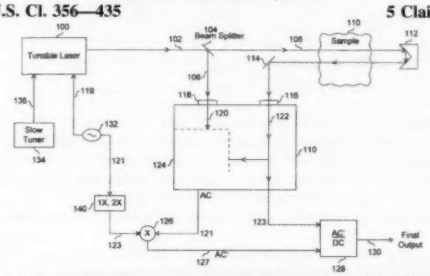
(d) dividing the optical density by the concentration of the pigment in the slurry to determine light scattering efficiency of the pigment.

6,040,914

SIMPLE, LOW COST, LASER ABSORPTION SENSOR SYSTEM

Michael L. Bortz, Palo Alto, and Asif A. Godil, Mountain View, both of Calif., assignors to New Focus, Inc., Santa Clara, Calif.

Filed Jun. 10, 1997, Appl. No. 872,617
Int. Cl.[7] G01N *21/31;21/39*
U.S. Cl. 356—435 **5 Claims**



1. A laser absorption system for measuring optical absorption of a sample across a range of wavelengths, and the laser absorption system comprising:

a tunable external cavity diode laser with a first input and a second input and an optical output, and the external cavity diode laser responsive to a sweep signal at the first input to mechanically sweep a beam at the output across the range of wavelengths, and the external cavity diode laser responsive to a modulation signal at the second input to dither the beam;

a signal source coupled to the second input of said tunable external cavity diode lasers and said signal source generating the modulation signal at a frequency suitable for derivative spectroscopy;

a splitter to split the laser beam into a reference beam and a signal beam and the signal beam intersecting the sample;

a reference photodetector that detects the reference beam and outputs a reference signal corresponding thereto;

a signal photodetector that detects the signal beam intersecting the sample and outputs an absorption signal corresponding thereto;

an autobalancer with a first input, a second input, and a first output, and the first input coupled to said reference photodetector to receive said reference signal, and the second input coupled to said signal photodetector to receive said absorption signal, and said autobalancer for processing the reference signal and the absorption signal and outputting at the first output a first autobalanced signal corresponding to the absorption signal with a reduction in a noise level thereof; and

a demodulator with a first input, a second input and an output, and the first input coupled to said signal source, and the second input coupled to said first output of said autobalancer, and said demodulator for demodulating the first autobalanced signal with the modulation signal and generating at the output a derivative signal corresponding to a derivative of an absorption curve of the sample.

6,040,915

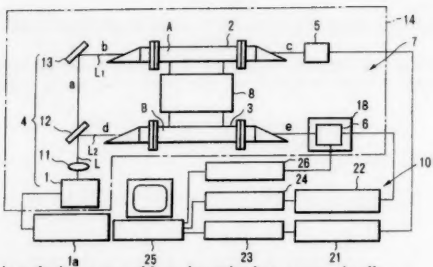
ANALYSIS METHOD FOR GASES AND APPARATUS THEREFOR

Shang-Qian Wu; Jun-ichi Morishita; Yoshio Ishihara, and Tetsuya Kimijima, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

PCT No. PCT/JP98/01608, § 371 Date Dec. 7, 1998, § 102(e) Date Dec. 7, 1998, PCT Pub. No. WO98/45686, PCT Pub. Date Oct. 15, 1998
PCT Filed Apr. 8, 1998, Appl. No. 147,349
Claims priority, application Japan, Apr. 9, 1997, 9-091158
Int. Cl.[7] G01N *21/61*
U.S. Cl. 356—435 **22 Claims**

1. A method for analyzing an impurity in a gas, comprising the steps of

introducing a gas with an impurity into a first cell;



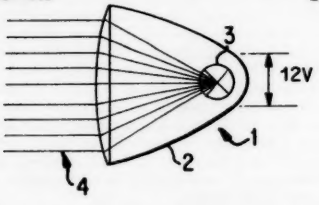
introducing a gas with no impurity into a second cell;
maintaining identical pressures in said first and second cells;
irradiating a light from a light irradiating source;
varying the frequency of said light over a frequency spectrum including an absorption frequency of said impurity;
splitting the light into a first beam and a second beam with a splitting device
passing said first beam through said first cell;
passing said second beam through said second cell;
measuring an intensity of light passed through said first cell over said frequency spectrum with a first measuring device;
measuring an intensity of light passed through said second cell over said frequency spectrum with a second measuring device; and
determining an absorption spectrum of the impurity in the gas with the impurity based on a difference between from measured with said first measuring device and data measured with said second measuring device.

6,040,916

PROCESS AND APPARATUS FOR DETERMINING THE CONDITION OF A ROAD SURFACE

Manfred Griesinger, Leonberg, Germany, assignor to Daimler-Chrysler AG, Germany

Filed Aug. 20, 1998, Appl. No. 136,928
Claims priority, application Germany, Aug. 20, 1997, 197 36 138; European Pat. Off., Feb. 26, 1998, 98103365
Int. Cl.[7] G01N *21/25;21/00;* **G01B** *11/00;* **G08G** *1/09*
U.S. Cl. 356—448 **20 Claims**



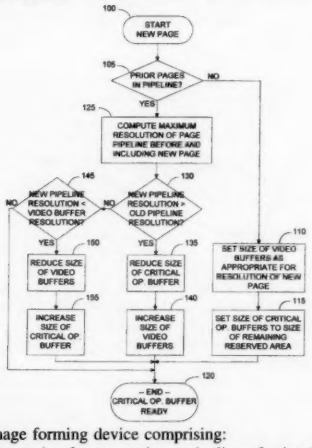
1. A process for determining a condition of a road surface, comprising:
beaming light onto the road surface, said light including a first light fraction having a first wavelength range which is not significantly absorbed by water/ice, and a second light fraction having a second wavelength range which is significantly absorbed by water/ice, said first light fraction including first light components with differing wavelengths;
detecting backscattered light from the road surface;
analyzing the backscattered light from the road surface to obtain a spectral intensity distribution curve;
determining an approximation reference curve for spectral intensity distribution of the backscattered light when the road is dry using spectral data of the detected backscattered light;
calculating a difference between spectral data of light backscattered from the second light fraction and corresponding data of the approximation reference curve for at least one wavelength of the second wavelength range, to obtain a difference curve; and
determining the condition of the road surface based on the calculated difference curve; wherein
the second light fraction contains a plurality of different wavelengths; and
the difference between the spectral data of the second backscattered-light fraction and the corresponding approximation reference curve data is determined as a difference curve between a measured spectral curve of the backscattered light and the approximation reference curve in the second wavelength range.

6,040,917

MEMORY PARTITIONING FOR MULTI-RESOLUTION PAUSELESS PAGE PRINTING

Russell Campbell; Richard M. Dow; Timothy P. Blair, and Burton H. Poppenga, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1997, Appl. No. 958,437
Int. Cl.[7] G06K *15/00*
U.S. Cl. 358—1.17 **20 Claims**



1. An image forming device comprising:
(a) a print engine for processing a pipeline of print data;
(b) a general memory area connected to the print engine;
(c) first and second reserved memory areas connected to the print engine; and,
(d) means for managing page description data in the general memory area, and for managing rendered page strip data in the first reserved memory area for immediate next output to the print engine, and for managing critical operation data in the second reserved memory area for enabling a generation of the rendered page strip data without flushing the first reserved memory area, such that constant throughput of the pipeline of print data is improved through reduced printing pauses.

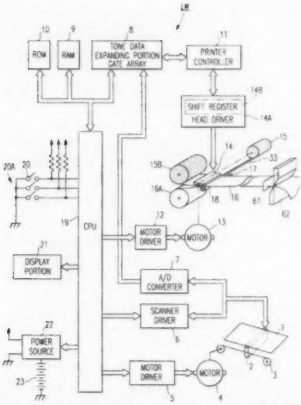
6,040,918

COPYING MACHINE

Isao Edatsune; Hiroshi Kuriyama, and Osamu Urano, all of Nagano-ken, Japan, assignors to Sieko Epson Corporation, Tokyo, Japan

Continuation of application No. 08/491,833, filed as application No. PCT/JP94/01660, Apr. 10, 1994, Pat. No. 5,699,166.
This application Sep. 9, 1997, Appl. No. 926,385.
Claims priority, application Japan, Nov. 9, 1993, 5-279859; Nov. 18, 1993, 5-289549
Int. Cl.[7] G03G *15/05*
U.S. Cl. 358—296 **10 Claims**

1. A copying machine comprising:



a recording medium being in a form of a roll having an image carrying sheet with a printing face for printing an image, a release sheet releasably secured to a back surface of the image carrying sheet;

an image reading scanner for reading an original image line by line and digitally transforming the original image into image data storable in a memory, wherein the image data includes tone data;

an image printing device having a printing head for printing the image data based on the tone data on the recording medium by the printing head;

a recording medium conveying mechanism; and

a cartridge for mounting the recording medium and the recording medium conveying mechanism;

the recording medium conveying mechanism conveying the recording medium to the image printing device, wherein the recording medium conveying mechanism has a cartridge fitting portion adapted for removably mounting the cartridge to the copying machine.

6,040,919

READING-RECORDING APPARATUS HAVING A LID MEMBER WHICH SERVES AS A PAPER GUIDE

Naohiro Iwata, Yokosuka; Katsumi Obana, Funabashi; Hideyuki Terashima, Sagamihara, and Noriyuki Aoki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1997, Appl. No. 928,459

Int. Cl.[7] H04N *1/00;1/04;* **G03G** *15/00*

U.S. Cl. 358—400 **10 Claims**

1. A reading-recording apparatus including:

an apparatus body;

an operating portion disposed on the upper surface of said apparatus body;

an original conveying path for conveying an original from above to forwardly of said apparatus body;

a recording sheet conveying path for conveying a recording sheet from above to forwardly of said apparatus body, with said recording sheet conveying path being arranged substantially parallel to said original conveying path in a same conveying direction to form a space portion between said recording sheet conveying path and said original conveying path;

a reading portion for causing said original conveying path to convey the original and reading image information therefrom, with said reading portion being provided on the space portion;

a recording portion for causing said recording sheet conveying path to convey the recording sheet and effecting recording thereon, with said recording portion being provided on the space portion adjacent to said reading portion; and

said lid member, when in its closed position, covering said operating portion, and when in its opened position, supporting the original and the recording sheet so as to be guided by said original conveying path and said recording sheet conveying path.

6,040,920

DOCUMENT STORAGE APPARATUS

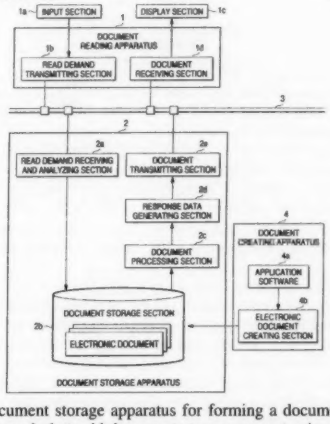
Hideki Ichiriki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1997, Appl. No. 802,567

Claims priority, application Japan, Feb. 20, 1996, 8-032484; Feb. 20, 1996, 8-032490

Int. Cl.[7] H04N *1/00*

U.S. Cl. 358—403 **8 Claims**



1. A document storage apparatus for forming a document reading system such that said document storage apparatus is combined with a document reading apparatus comprising read demand transmitting means for transmitting a read demand and document receiving means for receiving a document transmitted in response to the read demand to display the received document and to create a read demand in accordance with reference information of the displayed document in a case where the reference information has been instructed, said document storage apparatus comprising:

read demand receiving and analyzing means for receiving the read demand issued from said document reading apparatus to analyze required contents;

document storage means for storing an electronic document held in page units;

document extracting means for extracting a subject page of the electronic document to meet the read demand;

response data generating means for generating reference information to a front page and a rear page to meet the read demand to synthesize the reference information to the page of the electronic document extracted by said document extracting means so as to generate response data;

instruction means for referring to a preceding or next page of the extracted electronic document:

display means for displaying said reference information together with an image of the extracted page of the electronic document and for displaying instruction means; and

document transmitting means for transmitting the generated response data to said document reading apparatus from which the read demand has been issued.

6,040,921

COMMUNICATION APPARATUS

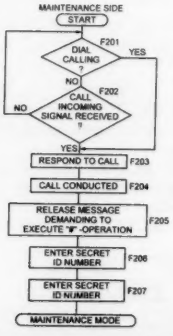
Motohiko Hayashi, Yamatokoriyama, and Masahiro Tanaka, Ikoma-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1997, Appl. No. 843,159

Claims priority, application Japan, Apr. 11, 1996, P8-089722

Int. Cl.[7] H04N *1/00*

U.S. Cl. 358—434 **16 Claims**



1. A communication apparatus for data communication over a communication channel based on technical communication parameters, the communication apparatus comprising:

detecting means for detecting a dual tone signal received through the communication channel for a maintenance mode separately establishable from a facsimile transmission mode, the dual tone signal representing at least a facsimile signaling setting of a particular one of the technical communication parameters for supporting traffic on the communications channel;

controlling means for controlling at least the facsimile signaling setting of the particular one of the communication parameters in accordance with a detection result obtained by the detecting means after a set-up time period of the maintenance mode primarily dependent upon determining whether a detected secret identification number represented by the dual tone signal matches a stored identification number; and

a monitor for monitoring the controlling means and the facsimile signaling setting of the particular one of the communication parameters during the maintenance mode to transmit a corresponding status message associated with the facsimile signaling setting over the communications channel.

6,040,922

DEVICE AND METHOD FOR FACSIMILE AND DATA COMMUNICATION

Takashi Umeda, Yokosuka, and Motoyasu Ohno, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1995, Appl. No. 444,588

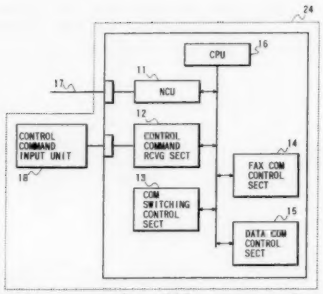
Claims priority, application Japan, May 20, 1994, 6-106547

Int. Cl.[7] H04N *1/32*

U.S. Cl. 358—468 **10 Claims**

1. A communication control device comprising:

a host computer; and



a data modem connected to said host computer for establishing communication between said host computer and a separate counterpart communication terminal,

said host computer feeding a predetermined command to said data modem before establishment of said communication, so as to command said data modem to shift to a data communication after performing a facsimile communication between said host computer and said counterpart communication terminal via said data modem, and

said data modem responding to a data communication shift acknowledge signal, received from said counterpart communication terminal after performing said facsimile communication, by feeding a predetermined notification signal to said host computer thereby carrying out a data communication shift process for implementing data communication with said counterpart communication terminal.

6,040,923

TRANSFER CONTROL APPARATUS FOR OPTICAL IMAGE READING APPARATUS

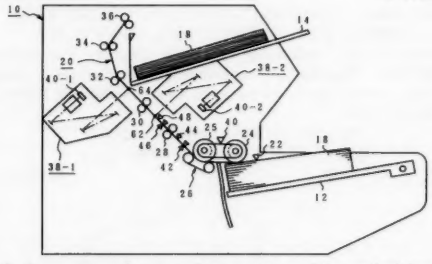
Yoshihiro Takashimizu, and Yoshio Tabata, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 11, 1997, Appl. No. 873,024

Claims priority, application Japan, Nov. 21, 1996, 8-310407

Int. Cl.[7] H04N *1/04;* **B65H** *7/12*

U.S. Cl. 358—498 **34 Claims**



1. A paper transfer control apparatus used for optical image reading apparatus that detects paper, which is transferred by a transfer mechanism, using one or more sensors, and optically reads an image on the paper, the paper transfer control apparatus comprising:

a transmission-type sensor detecting the paper;

a reflection-type sensor detecting the paper;

a sensor mode selecting unit for selecting one of said sensors;

a transmission-type sensor processing unit performing paper detection processing for said transmission-type sensor, based on a detection signal of the transmission-type sensor when selected by said sensor mode selecting unit; and

a reflection-type sensor processing unit performing paper detection processing for said reflection-type sensor, based on a detection signal of the reflection-type sensor when selected by said sensor mode selecting unit,

wherein each of said transmission-type sensor processing unit and said reflection-type sensor processing unit comprises:

a paper pass detection processing unit for detecting information regarding paper pass from change of sensor detection levels regarding front and back edges of the paper; and

a double-feed detection processing unit for detecting double-feed of paper based on the sensor detection level,

wherein said double-feed detection processing unit of said transmission-type sensor processing unit comprises:

a criterion-level setting unit for obtaining a sensor output L at the time of transferring the first sheet of paper in a criterion-level setting range having an upper limit Lup and a lower limit Ldown based on a quantity of light transmitted from a base color portion of paper by controlling light emission current of a sensor, detecting a sensor output corresponding to the quantity of light transmitted from the base color portion of the paper within the criterion-level setting range, and setting a criterion-level for double-feed decision, L0; and

a double-feed decision unit for setting a lower decision limit Lr1 and an upper decision limit Lr2 based on the criterion-level for double-feed decision, L0 that is set by said criterion-level setting unit, deciding to be double-feed of paper presently being transferred if the sensor output L becomes equal to or lower than said lower decision limited Lr1 when the second and later sheets of paper are transferred, and deciding to be double-feed of the first sheet of paper if the sensor output L becomes equal to or larger than said upper decision limit Lr2.

6,040,924

COLOR IMAGE FORMING APPARATUS

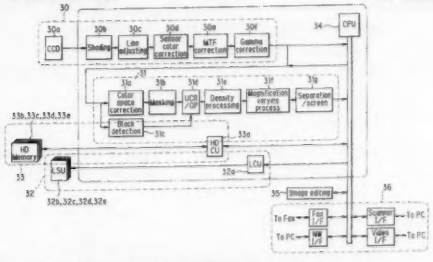
Akira Tamagaki, Souraku-gun; Yoichi Shimazawa; Hideo Matsuda, both of Nara, and Syoichiro Yoshiura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1998, Appl. No. 103,670

Claims priority, application Japan, Jun. 24, 1997, 9-167592

Int. Cl.[7] **G03F** *3/08;* **H04N** *1/21;* **B41B** *15/00;* **B41J** *15/00;* **G06F** *15/00*

U.S. Cl. 358—523 **10 Claims**



1. A color image forming apparatus comprising:

an input means for capturing color image information as color-separated sets of image information;

a color converting means for color-converting the color-separated sets of image information input through the input means into color-converted sets of image information;

a rotary type storage means for storing the color-converted sets of image information;

a writing means for writing plural color-converted sets of grouped image information, onto the rotary type storage means;

a reading means for reading the color-converted sets of image information from the rotary type storage means; and

color image forming means for reproducing different color images corresponding to the color-converted sets of image information, retrieved by the reading means, wherein the writing means can designate addresses at which color-converted sets of image information of different colors are written on the rotary type storage means in an alternating or cyclic manner in accordance with the number of the color-converted sets of image information to be read in parallel from the rotary type storage means by the reading means.

6,040,925

RADIAL AND PRUNED RADIAL INTERPOLATION

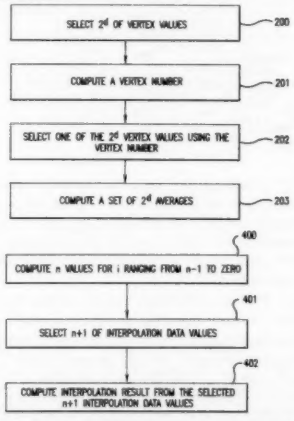
Gary L. Vondran, Jr., Winchester, and Giuseppe Desoli, Brookline, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1997, Appl. No. 989,929

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03F** *3/08;* **H04N** *1/46;* **B41B** *15/00*

U.S. Cl. 358—525 **30 Claims**


SELECT 2^d OF VERTEX VALUES
200
COMPUTE A VERTEX NUMBER
201
SELECT ONE OF THE 2^d VERTEX VALUES USING THE VERTEX NUMBER
202
COMPUTE A SET OF 2^d AVERAGES
203
400
COMPUTE n VALUES FOR i RANGING FROM n-1 TO ZERO
401
SELECT n+1 OF INTERPOLATION DATA VALUES
402
COMPUTE INTERPOLATION RESULT FROM THE SELECTED n+1 INTERPOLATION DATA VALUES

1. A pruned radial interpolator for interpolating between interpolation data values using input data values each having d components to generate output data values, each of said interpolation data values includes a plurality of interpolation data value bits, said d components of said input data values represented by d sets of bits each partitioned to form d sets of higher order bits and d sets of lower order bits, said d sets of higher order bits used for selecting 2^d of said interpolation data values, said pruned radial interpolator comprising:

a first multiplexer having a first multiplexer output, said first multiplexer configured for receiving said 2^d of said interpolation data values, said first multiplexer for selecting a first one of said 2^d of said interpolation data values responsive to a first value determined from said d sets of lower order bits; and

a first adder having a first input, a second input, and an output, said first input coupled to said first multiplexer output, said second input configured to receive a second one of said 2^d of said interpolation data values selected using said d sets of upper order bits.

6,040,926

COMMON NON-SYMMETRIC PRUNED RADIAL AND NON-SYMMETRIC PRUNED TETRAHEDRAL INTERPOLATION HARDWARE IMPLEMENTATION

Gary L. Vondran, Jr., Winchester, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

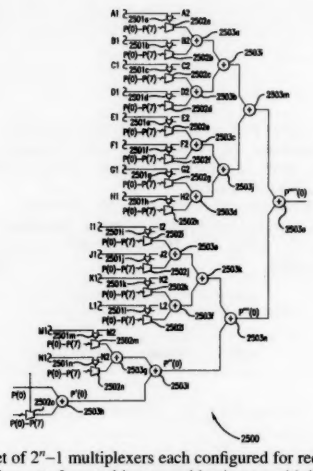
Filed Dec. 12, 1997, Appl. No. 989,998

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03F** *3/08;* **H04N** *1/46;* **B41B** *15/00*

U.S. Cl. 358—525 **18 Claims**

1. A common non-symmetric pruned radial and non-symmetric pruned tetrahedral interpolator for interpolating between interpolation data values using input data values each having d components to generate output data values, said d components represented, correspondingly, by d sets of bits each partitioned to form d sets of lower order bits each having, respectively, $n_1, n_2, n_3, \ldots n_d$ of said bits, said common non-symmetric pruned radial and non-symmetric pruned tetrahedral interpolator comprising:



a first set of 2^n-1 multiplexers each configured for receiving one of a first set of control inputs and having a multiplexer output where n equals the greatest of said n_1, n_2, n_3, . . . n_d, each of said multiplexers of said first set for selecting from said interpolation data values responsive to said one of said first set of control inputs;

a second set of 2^n-2 multiplexers each having a multiplexer output, each of said multiplexer output of said second set coupled to one of said multiplexers of said first set of multiplexers, said second set of multiplexers to supply 2^n-2 of said first set of control inputs by each of said second set of multiplexers selecting between one of a first set of values and one of a second set of values, responsive to one of a second set of control inputs, where determining said first set of values includes using a first function and determining said second set of values includes using a second function and a third function; and

a means for adding configured for receiving said multiplexer output of said first set of multiplexers.

6,040,927

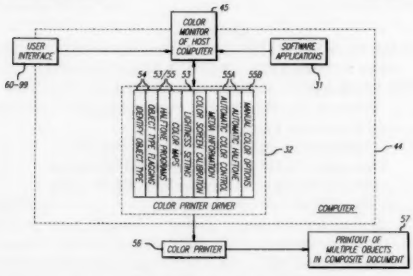
COLOR HALFTONING OPTIONS INFLUENCED BY PRINT-MODE SETTING

Kirt Alan Winter, Escondido, and Thomas G. Smith, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of application No. 08/187,933, Jan. 27, 1994, abandoned. This application Dec. 4, 1996, Appl. No. 759,399.

Int. Cl.[7] **H04N** *1/40*

U.S. Cl. 358—534 **31 Claims**



1. A method of controlling the quality of printing a composite document having objects of different object types to be printed, wherein selection of printing-quality or printing-speed modes, which allocate printing of pixels as among passes or nozzles of a scanning printhead, is used to automatically control methods of rendition as well; said method comprising the steps of:

providing a plurality of different selectable print modes, namely and specifically printing-quality modes or printing-speed modes, or both, to allocate printing of pixels as among passes or nozzles of a scanning printhead;

automatically distinguishing a plurality of different object types any of which may be in such composite document, including distinguishing at least one particular given object of a particular given one type;

developing a designation of one of said plurality of print modes, to be used in printing;

in response to said designation-developing step, automatically selecting said designated print mode for use in printing;

for printing said one particular given object of said particular given one type, either:

invoking a first print-rendering option, namely and specifically a first method for establishing what colors will be printed at each elemental position of said object, if said object is to be printed in a first print mode; or

alternatively invoking a second print-rendering option, namely and specifically a second method for establishing what colors will be printed at each elemental position of said object, if said object is to be printed in a second print mode; and

then automatically rendering and printing, using whichever of said first or second print modes whose designation was developed in the designation-developing step, including rendering and printing said one particular given object of said particular given one type using the corresponding first or second invoked rendering option, respectively.

6,040,928

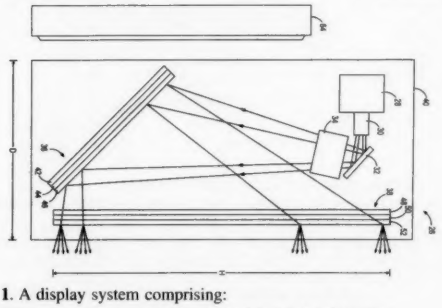
HOLOGRAPHIC DESKTOP MONITOR

Milan M. Popovich, Leicester, United Kingdom, assignor to DigiLens, Inc., Sunnyvale, Calif.

Provisional application No. 60/108,670, Nov. 16, 1998. This application Sep. 2, 1999, Appl. No. 388,801.

Int. Cl.[7] **G02B** *5/32;* **G02F** *1/13;* **G03B** *21/28;* **H04N** *5/72*

U.S. Cl. 359—15 **20 Claims**



1. A display system comprising:

image-generating means for projecting an input image;

redirecting means optically positioned to receive said input image propagating in an initial direction for reflecting and diffracting said input image toward a second direction different than said initial direction, said redirecting means including a first reconfigurable holographic optical element having a controllable optical characteristic that is responsive to an applied electrical field; and

display means operatively associated with said redirecting means for displaying said input image reflected and diffracted by said redirecting means.

6,040,929
LIGHT BEAM SCANNING APPARATUS

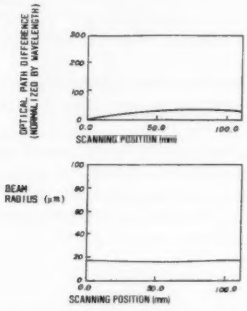
Shinya Hasegawa; Shigeo Kayashima; Satoshi Maeda, and Hirokazu Aritake, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of application No. 07/949,520, filed as application No. PCT/JP92/00371, Mar. 26, 1992, Pat. No. 5,680,253. This application Apr. 23, 1997, Appl. No. 844,994.

Claims priority, application Japan, Mar. 27, 1991, 3-62961; Jun. 12, 1991, 3-140205; Oct. 23, 1991, 3-275271; Oct. 24, 1991, 3-277497; Oct. 24, 1991, 3-277498; Oct. 24, 1991, 3-277499; Oct. 24, 1991, 3-277500; Dec. 4, 1991, 3-320162

Int. Cl.[7] G02B *5/32;26/10;27/44*

U.S. Cl. 359—17 **6 Claims**



1. A light-beam scanning apparatus for conducting a light scanning on a scanning surface by diffracting a light incident from a light source portion by a rotatable hologram, and by diffracting, by a fixed hologram plate, the resulting diffracted light, for use in a scanning conducted by a rotation of said rotatable hologram,

wherein said fixed hologram plate has a phase distribution Φ_H represented as a difference obtained when subtracting a reference wave phase Φ_a defined below from an object wave phase Φ_O defined below, where X is a scanning direction and Y is a cross scanning direction, C_1, C_2, Y_0, and Z_0 are constants, where

$\Phi_0(X, Y)=k_2(C_1X^2+C_2Y^2)$, $k_2=2\pi/\lambda_2$ where λ_2 is a wavelength of said incident light; and

$$\Phi_R(X, Y) = k_1\left(\sqrt{X^2 + (Y - Y_0)^2 + Z_0^2} - \sqrt{X^2 - Z_0^2}\right),$$

$$k_1 = 2\pi/\lambda, \text{ where } \lambda_1,$$

where λ_1 is a wavelength of a constructing wave used for forming said fixed hologram plate.

6,040,930
VOLUME HOLOGRAPHIC STORAGE USING ROTATED SIGNAL BEAM ENCODER

John F. Heanue, San Jose; Andrew J. Daiber, Palo Alto, and James Colvin, Sunnyvale, all of Calif., assignors to Siros Technologies, Inc., San Jose, Calif.

Filed May 1, 1998, Appl. No. 71,428

Int. Cl.[7] G02B *5/32;* **G03H** *1/26;1/00;* **G11C** *13/04*

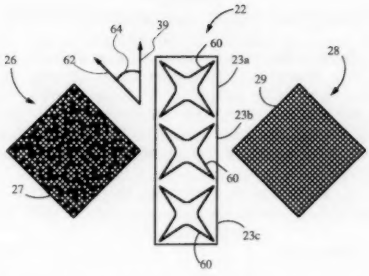
U.S. Cl. 359—21 **8 Claims**

1. A method of optimizing a packing density of holograms in a holographic storage medium, said method comprising the steps of:

a) generating a signal beam and a reference beam, said signal and reference beams defining a plane;

b) encoding a first data page in said signal beam, using an encoder having an oblique optical orientation with respect to a normal to said plane;

c) relaying said signal and reference beams to said storage medium, an overlap of said signal and reference beams within said storage medium defining a first storage subvolume; and



d) holographically storing said first data page in said first storage subvolume;

wherein said oblique optical orientation is selected to minimize a length parallel to said normal of said first storage subvolume.

6,040,931
OPTICAL TRANSMITTER, TERMINAL-STATION APPARATUS HAVING THE OPTICAL TRANSMITTER, AND OPTICAL COMMUNICATION SYSTEM

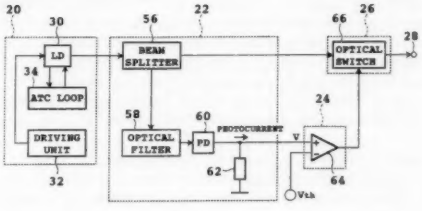
Akimitsu Miyazaki; Sadao Ibukuro, and Yasunori Nagakubo, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 20, 1997, Appl. No. 859,253

Claims priority, application Japan, Nov. 26, 1996, 8-314744

Int. Cl.[7] H04B *10/08*

U.S. Cl. 359—110 **24 Claims**



19. An optical transmitter comprising:

a light-source unit for generating an optical signal;

a monitor for monitoring a parameter depending on a wavelength of said optical signal;

a determiner for determining as to whether or not said monitored parameter satisfies a predetermined condition; and

a shut-off unit for shutting off said optical signal in case said monitored parameter does not satisfy said predetermined condition, wherein

said monitor comprises

a beam splitter for splitting said optical signal into a main beam and an auxiliary beam,

means for providing an angle dispersion to said auxiliary beam, and

a photo detector for detecting said auxiliary beam having said angle dispersion, and

said parameter is a signal output by said photo detector.

6,040,932

METHOD AND CIRCUIT FOR DEMULTIPLEXING AN OPTICAL SIGNAL

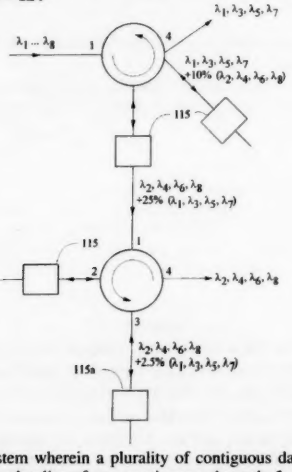
Gary S. Duck, 6 Barcham Crescent, Nepean, Ontario, Canada, K2J 3Z7; Koichi Abé, 60 Robert Street, Ottawa, Ontario, Canada, K2P 1G4; Joseph Ip, 57 Drainic Drive, Kanata, Ontario, Canada, K2C 3J7; Mark Farries, 26 Tiverton, Drive, Nepean, Ontario, Canada, K2E 6L5, and Paul Colbourne, 45D Woodfield Drive, Nepean, Ontario, Canada, K2G 3Y6

Filed May 29, 1997, Appl. No. 864,895

Claims priority, application Canada, Apr. 25, 1997, 2203729

Int. Cl.[7] H04J *14/02*

U.S. Cl. 359—124 **18 Claims**



1. In a system wherein a plurality of contiguous data channels comprising a plurality of non-contiguous channels **1**, . . . n centered at wavelengths of light λ1 . . . λn, respectively, multiplexed within a single optical signal, wherein the signal comprises at least a data channel spaced having a center wavelength spaced from a center wavelength of a subsequent or next data channel by a distance of "d" nanometers, and wherein λ . . . <λn, and wherein n is an integer, a method of demultiplexing or de-interleaving data channels corresponding to at least some non-contiguous data channels from the single optical signal, comprising the steps of:

launching the single optical signal into an input port of an etalon, the etalon having a free spectral range (or period) corresponding to substantially "k2d", where "k" is an integer >0;

extracting only a portion of the launched optical signal in the form of a reflected signal captured from an output port on the etalon comprising only data channels spaced by a distance "k2d".

6,040,933

METHOD AND APPARATUS FOR CHANNEL EQUALIZATION IN WAVELENGTH DIVISION MULTIPLEXED SYSTEMS

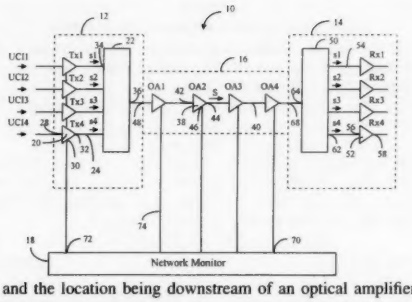
Farideh Khaleghi, Ottawa; Alan Glen Solheim, Kanata, and Chris Wilhelm Barnard, Ottawa, all of Canada, assignors to Nortel Networks Corporation, Montreal, Canada

Filed Dec. 19, 1997, Appl. No. 994,761

Int. Cl.[7] H04B *14/00; 10/08*

U.S. Cl. 359—124 **13 Claims**

1. A method of equalizing performance of a first channel transmitting a first signal from a first transmitter along a first transmission path with respect to performance of a second channel transmitting a second signal from a second transmitter along a second transmission path the equalization being effective at a predetermined location in an optical wavelength division multiplexed system and the location being downstream of an optical amplifier in the first path and downstream of an optical amplifier in the second path, the method comprising:



measuring the optical power of the first signal and the second signal at the inputs of each optical amplifier that is upstream of said location; and

adjusting the optical power of the first transmitter by an amount dependent upon the sum of the reciprocal of the first signal optical power measurements relative to the sum of the reciprocal of the second signal optical power measurements.

6,040,934

RECEPTACLE-TYPE OPTICAL TRANSMISSION/ RECEPTION APPARATUS

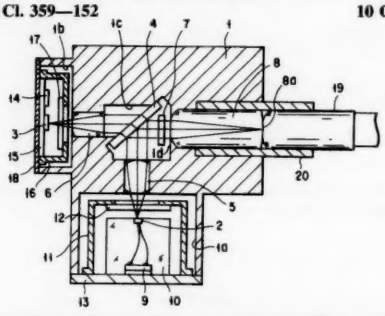
Masahiro Ogusu; Tazuko Tomioka, both of Tokyo, and Shigeru Ohshima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 19, 1997, Appl. No. 878,553

Claims priority, application Japan, Jun. 21, 1996, 8-161780

Int. Cl.[7] H04B *10/00*

U.S. Cl. 359—152 **10 Claims**



1. A receptacle-type optical transmission/reception apparatus comprising:

a casing;

a glass rod rigidly affixed to said casing and including a physical contact face contacted with an optical fiber ferrule;

a receptacle arranged in said casing and configured to detachably hold said optical fiber ferrule in tight contact with said physical contact face of said glass rod;

a semiconductor laser device arranged in said casing and configured to emit light through said glass rod;

a photodetecting device arranged in said casing and configured to detect light incident through said glass rod; and

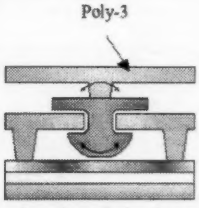
an optical branching device configured to guide the light emitted from said semiconductor laser device to said glass rod and to guide the light incident through said glass rod to said photodetecting device.

6,040,935

FLEXURELESS MULTI-STABLE MICROMIRRORS FOR OPTICAL SWITCHING

M. Adrian Michalicek, Broomfield, Colo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 25, 1999, Appl. No. 237,140
Int. Cl.[7] G02B *26/08*
U.S. Cl. 359—198 3 Claims



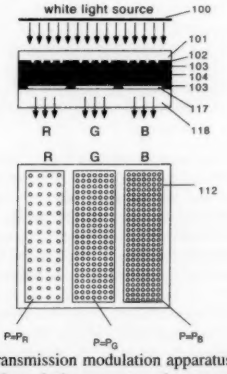
1. A flexureless micromirror device in a structural assembly, comprising a micromirror surface attached to one or more support columns, said support columns being anchored to the structural assembly of the device by a flexible locking joint, whereby the mirror surface is free to move about the joint and the mirror surface can be electronically switched between multiple stable positions.

6,040,936

OPTICAL TRANSMISSION CONTROL APPARATUS UTILIZING METAL FILMS PERFORATED WITH SUBWAVELENGTH-DIAMETER HOLES

Tae Jin Kim, Plainsboro; Tineke Thio, Princeton, and Thomas Wren Ebbesen, Plainsboro, all of N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.

Filed Oct. 8, 1998, Appl. No. 168,265
Int. Cl.[7] G02F *1/03;* G09G *3/36*
U.S. Cl. 359—245 71 Claims



1. An optical transmission modulation apparatus for modulating light transmitted through the apparatus, the apparatus comprising:

a metal film having a periodic array of subwavelength-diameter holes provided therein; and

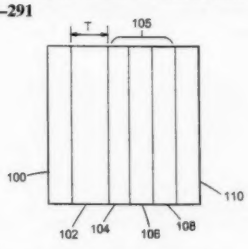
a supporting layer, at least a portion of the supporting layer having a selectively variable refractive index, the selectively variable refractive index portion being substantially adjacent to the metal film such that the metal film and the supporting layer comprise a perforated metal film unit, and wherein selective variation of the refractive index of the selectively variable refractive index portion modulates the intensity of the light transmitted through the perforated metal film unit without substantially changing the direction of the light.

6,040,937

INTERFEROMETRIC MODULATION

Mark W. Miles, Boston, Mass., assignor to Etalon, Inc., Boston, Mass.

Division of application No. 08/554,630, Nov. 6, 1995, abandoned, which is a continuation-in-part of application No. 08/238,750, May 5, 1994, Pat. No. 5,835,255. This application Jul. 31, 1996, Appl. No. 688,710.
Int. Cl.[7] G02B *26/00;1/10;5/28*
U.S. Cl. 359—291 26 Claims



1. An interferometric modulator comprising

a first element comprising a reflector, and

a second element including an induced absorber comprising a sandwich of an absorber between two matching layers,

at least one of the matching layers comprising a combination of at least two of; a metal film, a dielectric film, and a semiconducting film, and

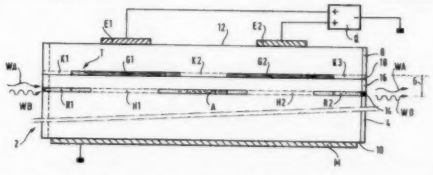
the reflector comprising at least one of a metal film, a dielectric film, and a semiconducting film.

6,040,938

SEMICONDUCTOR OPTICAL AMPLIFIER

Thomas Ducellier, Bures sur Yvette, France, assignor to Alcatel, Paris, France

Filed Sep. 4, 1997, Appl. No. 923,584
Claims priority, application France, Sep. 6, 1996, 96 10898
Int. Cl.[7] H01S *3/18;* H01L *31/14;* G02F *1/35*
U.S. Cl. 359—344 9 Claims



1. A semiconductor optical amplifier including, in integrated form,

a guide structure with a succession of longitudinal segments to constitute guide segments forming a path for lightwaves, said path for lightwaves including a linear response attenuation segment in series between first and second amplification segments,

wherein said amplification segments are adapted to amplify said lightwaves by recombination of charge carriers with said amplification performed with local gains proportionately to local densities of said carriers and

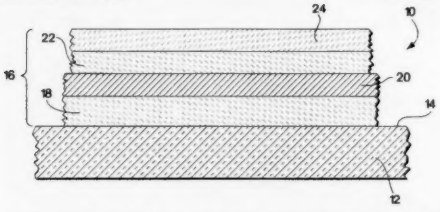
wherein attenuation by said attenuation segment is less than a gain of the first amplification segment but sufficient to avoid saturation of a gain of the second amplification segment.

6,040,939

ANTI-SOLAR AND LOW EMISSIVITY FUNCTIONING MULTI-LAYER COATINGS ON TRANSPARENT SUBSTRATES

Hüyla Demiryont, Philadelphia, Pa.; Hüseyin Parlar, Erenköy, Turkey; Ayse Ersoy, Sahrayicedid, Turkey, and Ender Aktulga, Şa¸kinbakkal, Turkey, assignors to Turkiye Sise ve cam Fabrikalari A.S., Istanbul, Turkey

Filed Jun. 16, 1998, Appl. No. 98,316
Int. Cl.[7] G02B *5/28;1/10;* C03C *17/36;* B05D *5/06*
U.S. Cl. 359—360 40 Claims



1. A coated article of manufacture comprising a substantially transparent substrate with a substantially transparent coating on a surface of the substrate, the substantially transparent coating comprising:

a first anti-reflection layer of dielectric material,

an infra-red reflective layer of silver metal overlying the anti-reflection dielectric layer,

a buffer layer selected from silica, silicon, silicon nitride and tungsten nitride materials, directly overlying the infra-red reflective layer of silver metal, and

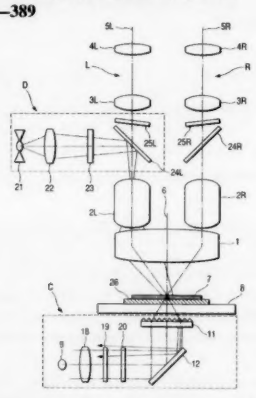
a second anti-reflection layer of tungsten oxide overlying the buffer layer.

6,040,940

REFLECTING FLUORESCENCE MICROSCOPE

Kenji Kawasaki, Musashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1999, Appl. No. 241,050
Claims priority, application Japan, Feb. 4, 1998, 10-022451
Int. Cl.[7] G02B *21/06;21/16*
U.S. Cl. 359—389 17 Claims



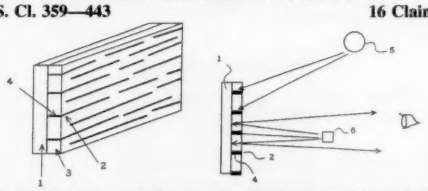
1. A microscope having a reflecting fluorescence illumination optical system, equipped with an observation optical system and specimen supporting means for mounting a specimen, wherein an optical member for attenuating excited light supplied from said reflecting fluorescence illumination optical system is interposed between said specimen and said specimen supporting means.

6,040,941

REFLECTION SCREEN AND METHOD FOR PRODUCING THE SAME

Minoru Miwa, Kakamigahara; Akiyoshi Takeno, Gifu; Toshihiro Koike, Urawa; Satoshi Ako, Asaka, and Yasunori Sugiyama, Yono, all of Japan, assignors to Kimoto Co., Ltd., Japan

Filed Jul. 15, 1997, Appl. No. 892,398
Claims priority, application Japan, Jul. 19, 1996, 8-208875
Int. Cl.[7] G03B *21/56;* G02B *27/00;* B29D *11/00*
U.S. Cl. 359—443 16 Claims



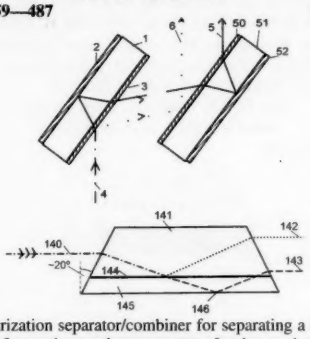
1. A reflection screen for image projection comprising a light-reflecting substrate and, adhered to one surface of said substrate, a light-transmitting polymer layer having light absorptive crazes of regular directionality, said light absorptive crazes containing a light absorptive dye or pigment.

6,040,942

POLARIZATION SEPARATOR/COMBINER

Ernest Eisenhardt Bergmann, Fountain Hill, Pa., assignor to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Jul. 24, 1997, Appl. No. 899,581
Int. Cl.[7] G02B *5/30*
U.S. Cl. 359—487 10 Claims



1. A polarization separator/combiner for separating a light beam comprising first and second components of orthogonal polarization into separate first and second light beams having substantially homogeneous and orthogonal polarization, or for combining separate first and second light beams having substantially homogeneous and orthogonal polarization into a single light beam comprising orthogonally polarized components, the separator/combiner comprising:

a first plate and a second plate, each plate comprising:

a first surface and a second surface, the first surface and the second surface being parallel, and spaced apart by the thickness of a transparent body therebetween,

the first surface having a coating applied thereto, such that the first surface forms a planar polarizing interface,

the coating being selected such that when a light beam having a first component having a first polarization and a second component having a second polarization orthogonal to the polarization of the first component strikes the first surface at a predetermined angle, the first component of light beam is substantially reflected by the coating, and the second component of the light beam is substantially transmitted through the coating;

the second surface of the plate forming a planar reflective interface;

such that the second component of light passes through the polarizing interface and through the transparent body of the plate, reflects off the reflective interface, and passes again through the polarzing interface, emerging parallel to the first light component,

the first plate being mounted parallel to the second plate and spaced apart therefrom, such that the first component and the second component pass from the first plate to the second plate without any optical components in the optical path between the first plate and the second plate which would effect the polarization of either the first component or the second component,

such that one of the first component and second component is reflected from the polarizing interface of the second plate to become parallel to the light beam, and the other component is transmitted through the polarizing interface of the second plate, reflects from the reflective interface of the second plate, and emerges through the polarization interface of the second plate, parallel to the light beam.

6,040,943

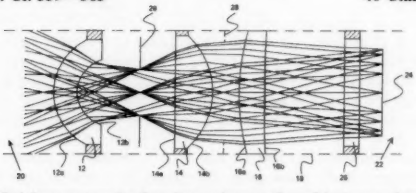
DIGITAL CAMERA OBJECTIVE WITH DIFFRACTIVE OPTICAL SURFACE

Michael P. Schaub, Tucson, Ariz., assignor to Donnelly Optics, Tucson, Ariz.

Filed Mar. 23, 1998, Appl. No. 46,168

Int. Cl.[7] G02B *27/44;3/02;9/00*

U.S. Cl. 359—565 **40 Claims**



24. A lens system for forming an image of an object on an image plane, said lens system comprising a first negative lens closest to an object side, a third lens closest to an image side, and a second power lens disposed between said first lens and said third lens, with each lens having first and second surfaces, said first surface of said third lens comprising a diffractive surface, said first surface being closer to said object side, said lens system comprising no more than three lens elements and being corrected for axial and lateral chromatic aberrations of light passing therethrough.

6,040,944

PRECISION TUNABLE OPTICAL FILTER

Jing-Jong Pan, Milpitas; Jingyu Xu, and Yingzhong Shi, both of San Jose, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Provisional application No. 60/047,938, May 29, 1997. This application Jan. 26, 1998, Appl. No. 13,803.

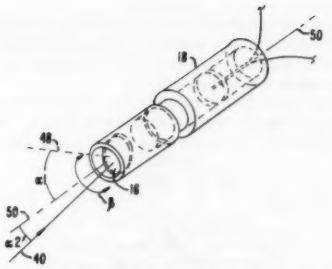
Int. Cl.[7] G02B *6/38;5/28;26/08*

U.S. Cl. 359—590 **21 Claims**

1. A method for tuning an optical filter system, the filter system including a first filter and a second filter, the first filter having a surface and transmitting or reflecting light along a normal to the surface in a first wavelength range, the second filter reflecting or transmitting light in a target wavelength range, the method comprising;

directing light toward the first filter so that the light is incident upon the surface at an angle, and so that the first filter transmits or reflects a portion of the incident light which is within a second wavelength range;

displacing the second wavelength range independently of the target wavelength range by rotating the first filter relative to the second filter and about an axis which is oblique to the



incident light, and which is also oblique to the normal to the surface of the first filter to change the incident angle, wherein the first filter is rotated with a collimator assembly, wherein a GRIN lens of the collimating assembly is substantially coaxial with the axis of rotation, and

monitoring the second wavelength range from the first filter and terminating the rotating step when the second wavelength range is aligned with the target wavelength range.

6,040,945

HEAD MOUNT DISPLAY DEVICE

Joji Karasawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

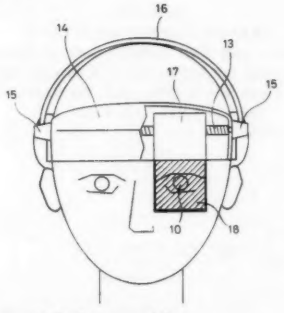
Continuation of application No. 08/945,807, Nov. 12, 1997, which is a continuation of application No. PCT/JP97/00747, Mar. 10, 1997. This application Jan. 25, 1999, Appl. No. 236,442.

Claims priority, application Japan, Mar. 11, 1996, 8-53296

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G02B *27/14*

U.S. Cl. 359—630 **1 Claim**



1. A head mount display, comprising:

an image display device;

a magnifying optical device configured to refract a first light beam representing an image formed on the image display device and thereby magnifying the image to create a magnified virtual image which is to be observed with one of the eyes of a user;

an image combining device for making the first light beam representing the virtual image enter the eye of the user simultaneously with a second light beam from a background view, thereby combining the virtual image with the background view to form a composite image; and

a switching device configured to shift at least two among the image display device, the magnifying optical device, and the image combining device, in order to make a switch between a first state in which the composite image of the virtual image and the background view is observed with one eye of the user and a second state in which the composite image is observed with the other eye of the user.

6,040,946

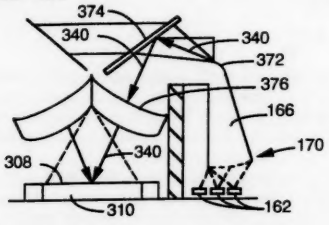
COLOR SUPERPOSITION AND MIXING OF LIGHT BEAMS FOR A VIDEO DISPLAY SYSTEM

Raymond T. Hebert, Los Gatos, Calif., assignor to Optimize Incorporated, Los Gatos, Calif.

Division of application No. 09/241,828, Feb. 1, 1999, which is a division of application No. 09/056,934, Apr. 6, 1998, Pat. No. 5,926,318. This application Jul. 27, 1999, Appl. No. 362,927.

Int. Cl.[7] G02B *27/14*

U.S. Cl. 359—630 **2 Claims**



1. A method of superimposing and mixing light beams of differing color components, comprising:

Collecting light beams of differing color components from a plurality of spatially distinct light emitting devices on a diffractive collector, said light beams of differing color components impinging on said diffractive collector at differing angles of incidence uniquely related to said differing color components; and

diffracting said light beams of differing color components at said diffractive collector, such that each said light beam of differing color components is diffracted at an angle uniquely related to said differing color component, wherein said light beams of differing color components are superimposed on one another.

6,040,947

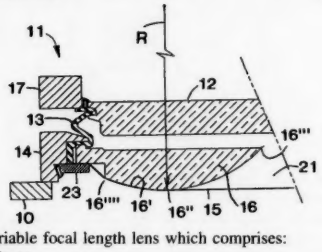
VARIABLE SPECTACLE LENS

Stephen Kurtin, and Saul Epstein, both of Sherman Oaks, Calif., assignors to Lane Research, Sherman Oaks, Calif.

Filed Jun. 9, 1998, Appl. No. 93,991

Int. Cl.[7] G02B *1/06;* G02C *7/06*

U.S. Cl. 359—666 **26 Claims**



1. A variable focal length lens which comprises:

a rigid lens;

a membrane support member positioned across and within the field of view of said rigid lens and spaced therefrom, said membrane support member including a toroidally shaped surface which comprises support means for supporting a transparent distensible membrane;

a transparent distensible membrane under radial tension positioned across the field of view of said rigid lens and against said toroidally shaped surface, tension in said membrane causing said membrane to bear against said toroidially shaped surface;

a transparent liquid filling the space between said rigid lens and said membrane;

flexible sealing means for retaining said transparent liquid between said rigid lens and said membrane; and

variable spacing means for adjusting the spacing between said membrane support member and said rigid lens.

6,040,948

THREE-GROUP ZOOM LENS HAVING A FIRST POSITIVE REFRACTING LENS GROUP, A SECOND POSITIVE REFRACTING LENS GROUP AND A THIRD NEGATIVE REFRACTING LENS GROUP

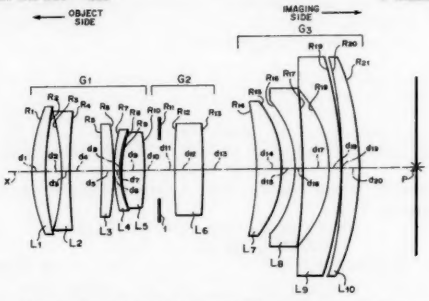
Nobuaki Toyama, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Feb. 12, 1998, Appl. No. 22,055

Claims priority, application Japan, Mar. 24, 1997, 9-090103

Int. Cl.[7] G02B *15/14*

U.S. Cl. 359—689 **3 Claims**



1. A three-group zoom lens comprising, successively from an object side, a first lens group having a positive refracting power, a second lens group having a positive refracting power, and a third lens group having a negative refracting power, in which, upon changing power from a wide angle end to a telephoto end, the three lens groups are moved toward the object side while changing a distance between said lens groups, so as to change the power;

wherein the first lens group comprises, successively from the object side, a positive refraction first lens having a convex surface directed onto the object side, a negative refraction second lens having a concave surface directed onto the object side, a positive refraction third lens, and a fourth lens subgroup composed of at least one positive refraction and at least one negative refraction lens; and

wherein the following conditional expressions:

$$2.2 \leqq f_2/f_1 \leqq 6.6 \quad (1)$$

$$2.2 \leqq f_2/f_w \leqq 5.0 \quad (2)$$

$$-1.1 \leqq R_3/f_w \leqq -0.5 \quad (3)$$

wherein

f_1 is a focal length of the first lens group;

f_2 is a focal length of the second lens group;

f_w is a focal length of the whole system at the wide angle end; and

R_3 is a radius of curvature of a surface of the second lens on the object side are satisfied.

6,040,949

SIMPLE WIDE-ANGLE ZOOM LENS

Kazunori Ohno, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

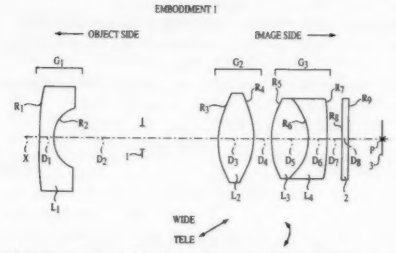
Filed Feb. 12, 1999, Appl. No. 249,159

Claims priority, application Japan, Feb. 19, 1998, 10-054387

Int. Cl.[7] G02B *15/14*

U.S. Cl. 359—689 **20 Claims**

1. A wide-angle lens comprising, in order from the object side, a first lens group of negative refractive power having a concave lens element surface on the image side, a second lens group of positive



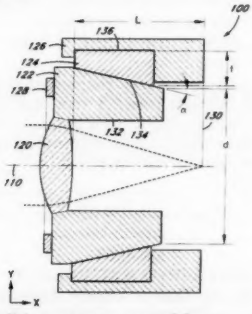
refractive power and including a biconvex lens element, and a third lens group of positive refractive power, side wide-angle zoom lens including only three lens groups and only four lens elements.

6,040,950

ATHERMALIZED MOUNTS FOR LENSES

Barry G. Broome, Carlsbad, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 5, 1998, Appl. No. 2,931
Int. Cl.[7] G02B *7/02*
U.S. Cl. 359—820 **42 Claims**



1. An athermalizing apparatus, comprising:

a lens element;

a support member coupled to the lens element, the support member having a sloped outer surface

a rib member having a sloped surface substantially complementary and adjacent to the sloped outer surface of the support member; and

an outer member coupled to the rib member.

6,040,951

OPTICAL APPARATUS HAVING HARD CIRCUIT BOARD ENCODER

Seiichi Kashiwaba, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

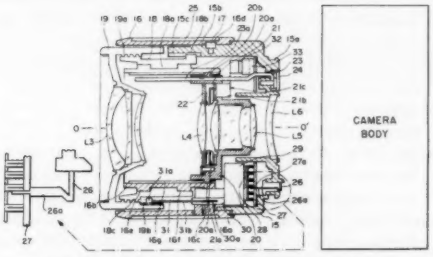
Continuation of application No. 08/245,824, May 18, 1994, abandoned, which is a continuation of application No. 07/744,326, Aug. 13, 1991, abandoned. This application Dec. 15, 1997, Appl. No. 990,638.
Claims priority, application Japan, Aug. 16, 1990, 2-216314
Int. Cl.[7] G02B *7/02;15/14*
U.S. Cl. 359—823 **40 Claims**

1. An optical apparatus comprising:

(a) a lens which can be moved in the direction of an optical axis of the apparatus;

(b) moving means for moving said lens; and

(c) a signal generator for detecting information about the movement of said lens, said signal generator comprising a circuit board which is disposed on a plane intersecting the optical axis and on which a signal generating pattern and a connector



are formed, and a signal generating member which is moved around the optical axis by a rotating member in said moving means and which slides on said signal generating pattern, wherein said signal generating pattern and said connector are provided on the same surface of said circuit board and wherein a wiring member in said apparatus is inserted into said connector; and

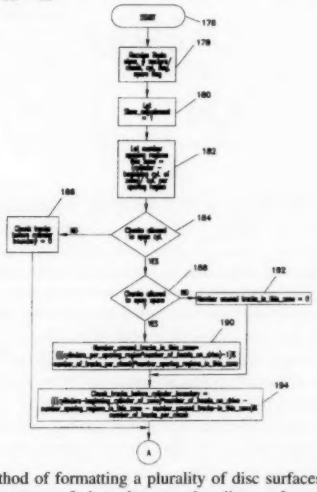
(d) a contact member contacting with another apparatus so as to electrically connect said optical apparatus to said another apparatus, said contact member having an elongated lead portion, the lead portion being soldered to the circuit board.

6,040,952

SYSTEM AND METHOD FOR FORMATTING DISC SURFACES

Mark A. Gaertner, Woodbury, Minn., and Mark A. Heath, Oklahoma City, Okla., assignors to Seagate Technology, Inc., Shakopee, Minn.

Division of application No. 08/911,322, Aug. 14, 1997. This application Aug. 27, 1999, Appl. No. 384,683.
Int. Cl.[7] G11B *5/09*
U.S. Cl. 360—48 **2 Claims**



1. A method of formatting a plurality of disc surfaces in a disc drive for storage of data thereon, the disc surfaces having a plurality of tracks thereon, associated tracks on the disc surfaces forming a cylinder, each cylinder being separated from adjacent cylinders by cylinder boundaries, the data being formed of data chunks, each data chunk to be stored in a group of tracks, at least some of the disc surfaces having spare tracks not to be formatted to receive data, the method comprising:

receiving a first parameter θ_{skew} indicative of a desired angular displacement between a beginning of a first data chunk and a beginning of a second data chunk to be stored on the disc surfaces;

receiving a second parameter θ_{gap} indicative of a desired angular displacement between an end of a previously adjacent data chunk and a beginning of a subsequent data chunk;

determining whether data chunks to be stored on the disc surfaces are allowed to cross cylinder boundaries;

determining whether data chunks to be stored on the disc surfaces are allowed to cross spare boundaries; and

formatting the disc surfaces, based on θ_{skew}, θ_{gap}, and whether the data blocks are allowed to span cylinder and spare boundaries, to store the data chunks such the beginning of data chunks on separate cylinders are separated by an angular displacement which is sufficient such that a seek time required to seek between the separate cylinders is less than a time required for the disc surfaces to rotate through the angular displacement.

6,040,953

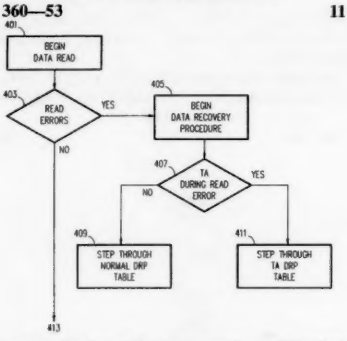
ADAPTIVE DATA RECOVERY METHOD AND MEANS TUNED TO THERMAL ASPERITIES IN A CYCLIC, MULTITRACKED MAGNETIC STORAGE SUBSYSTEM

Dan J. Malone, and Paul Hardy, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1997, Appl. No. 823,732

Int. Cl.[7] G11B *5/09;5/02;21/02*

U.S. Cl. 360—53 **11 Claims**



1. In a system having at least one cyclic, multitracked storage medium, means including a transducer for recording and reading binary data streams onto and from ones of said tracks, said data streams comprising codewords in an error correction code (ECC), means for detecting anomalous events associated with the transducer reading of said track-recorded data streams, and means responsive to detected events for executing an ordered list of data recovery protocols (DRPs) to resolve any consequential errors, a method for adaptively managing recovery from said detected events, comprising the steps of:

(a) concurrently detecting at least one anomalous event and an error or erasure in the read back of a track-recorded data stream;

(b) responsive to said concurrent detection, ascertaining whether the detected event is a member of a set of events associated with a high error or erasure rate in the read back of recorded data streams; and

(c) if the event is a member of the set of high error or erasure rate events, executing an ordered sublist of predetermined ones of the list of DRPs for resolving the detected error or erasure, otherwise executing the DRPs of the list in linear order whereby the average time of said system in executing lists of DRPs is reduced.

6,040,954

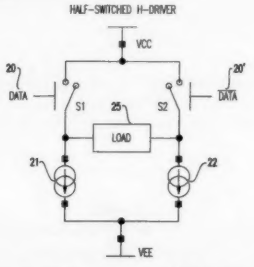
HIGH SPEED WRITE DRIVER FOR MAGNETIC INDUCTIVE WRITE HEAD USING A HALF-SWITCHED H-DRIVER

Steven J. Tanghe, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1997, Appl. No. 837,410

Int. Cl.[7] G11B *5/02*

U.S. Cl. 360—68 **7 Claims**



1. An H-driver circuit for operating an inductive recording head, said H-driver having a top half and a bottom half, comprising:

means for switching a current bidirectionally through said inductive recording head, responsive to binary alternations in a data signal, from said top half of said H-driver;

means for maintaining current flow bilaterally through said bottom half of said H-driver,

wherein increased current flow and voltage drop across said bidirectional switching means is very small and more than offset by an increase in a speed of transition of said bidirectional switching, thereby increasing transition speed of current through said inductive recording head.

6,040,955

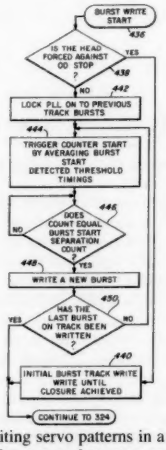
SELF SERVO WRITING FILE

Dana Henry Brown; Thomas Charles Christensen; Earl A. Cunningham, and Wayne A. Rogelstad, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 07/896,954, Jun. 11, 1992, abandoned. This application Aug. 8, 1994, Appl. No. 287,477.

Int. Cl.[7] G11B *21/10*

U.S. Cl. 360—75 **6 Claims**



1. A method for writing servo patterns in a direct access storage device including at least one data storage media mounted for rotation by a drive motor and an actuator for moving transducer

means relative to the data storage media for reading and writing data to the data storage media, said method comprising the steps of:

rotating said data storage media using the drive motor;

using said transducer means, writing servo information on the data storage media at a first portion of the data storage media using timing information developed without requiring the use of a clock track;

using said actuator and transducer means, moving offset from said last written servo information and detecting said written servo information until said detected servo signal equals a predetermined value;

developing timing information from said last written servo information;

using said transducer means, writing servo information on said data storage media responsive to said detected servo signal equal to said predetermined value using said timing information developed from said last written servo information without requiring the use of a clock track;

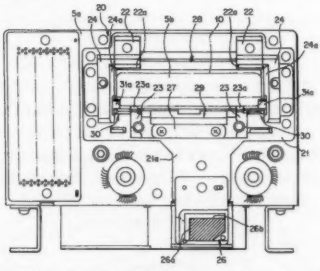
sequentially repeating said moving, developing timing information from said last written servo information and writing steps until a second portion of the data storage media is reached; and said servo information writing steps include writing a quad-burst servo amplitude pattern; and said moving and detecting steps include the steps of averaging of burst positions to create a circumferential position reference for writing subsequent servo information.

6,040,956

CARTRIDGE INSERTION/DISCHARGE OPENING STRUCTURE OF RECORDING/REPRODUCTION UNIT FOR LIBRARY APPARATUS

Kenichi Utsumi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1998, Appl. No. 21,345
Claims priority, application Japan, Sep. 9, 1997, 9-244318
Int. Cl.[7] G11B *15/68*
U.S. Cl. 360—92 **5 Claims**



1. A cartridge insertion/discharge opening structure of a recording/reproduction unit for use in a library apparatus for storing cartridges, each accommodating a storage medium in a casing mainly made of polycarbonate, the library apparatus having a transferring mechanism for transferring the cartridges stored in the library apparatus, the recording/reproduction unit being operable to perform a recording/reproduction process on the storage media within the cartridges transferred by the transferring mechanism, said cartridge insertion/discharge opening structure comprising:

a base member having an opening generally corresponding to a cartridge insertion/discharge opening section of the recording/reproduction unit for allowing the cartridges to be inserted into the recording/reproduction unit; and

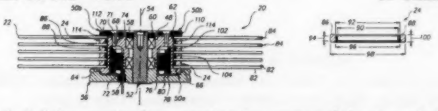
at least one guide member attached to said base member near a top of said opening and at least one guide member attached to said base member near a bottom of said opening for guiding the cartridges to be inserted into the recording/reproduction unit by the transferring mechanism, said guide members being made of polyacetal and extending into said opening of said base member to define a clearance space between said top and said bottom of said opening of said base member and a cartridge inserted in said cartridge insertion/discharge opening section of the recording/reproduction unit, to allow the transferring mechanism to release said cartridge once said cartridge is inserted in said cartridge insertion/discharge opening section.

6,040,957

DISK DRIVE DISK DAMPER

John Konings, Milpitas, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jun. 3, 1997, Appl. No. 868,190
Int. Cl.[7] G11B *17/028*
U.S. Cl. 360—98.08 **15 Claims**



1. A disk separator for separating two storage disks on a spindle of a disk drive, each storage disk having two sides, the disk separator comprising:

a disk spacer adapted for extending between one of the sides of each of the two storage disks and maintaining the two storage disks spaced apart a fixed, disk distance on the spindle, the disk spacer having a disk spacer height; and

a substantially elastic disk damper adapted for extending between one of the sides of each of the two storage disks and dampening the level of vibration in the storage disks, the disk damper having a disk damper height which is larger than the disk spacer height;

wherein the disk damper is substantially annular and is adapted for substantially encircling the spindle, and the disk spacer is substantially annular and is adapted for substantially encircling the spindle;

wherein the disk damper and the disk spacer are substantially concentric; and

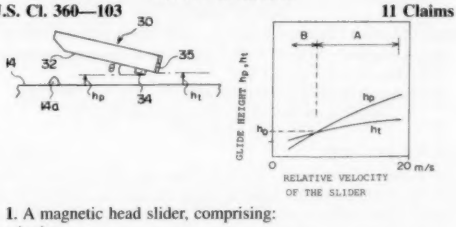
wherein the disk damper has a disk damper outer diameter which is larger than a disk spacer outer diameter of the disk spacer, and the disk damper and the disk spacer are secured together.

6,040,958

MAGNETIC HEAD SLIDER AND MAGNETIC DISK APPARATUS HAVING THE MAGNETIC HEAD SLIDER

Takayuki Yamamoto; Yoshiharu Kasamatsu; Takashi Toyoguchi; Toru Yokohata, and Ryosuke Koishi, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1996, Appl. No. 766,967
Claims priority, application Japan, Apr. 26, 1996, 8-106930
Int. Cl.[7] G11B *5/60*
U.S. Cl. 360—103 **11 Claims**



1. A magnetic head slider, comprising:

a body;

a first rail plane arranged on one side of the body for generating a first floating force;

at least one first pad arranged near an air outflow end of the first rail plane;

a second rail plane arranged on the other side of the body for generating a second floating force;

at least one second pad arranged near an air outflow end of the second rail plane on condition that a distance from the rearmost second pad closest to the air outflow end of the second rail plane is greater than a distance from the rearmost first pad to the air outflow end of the first rail plane; and

an electro-magnetic transducing device arranged on an air outflow end of the second rail plane;

wherein the magnetic head slider is inclined in a floating state in which the magnetic head slider floats over a surface of a disk medium such that said air outflow end of said first and second rail planes is lower than a corresponding air inflow end of said first and second rail planes and said air outflow end of said second rail plane is generally lower than said air outflow end of said first rail plane.

6,040,959

SLIDER WITH BLUNT EDGES

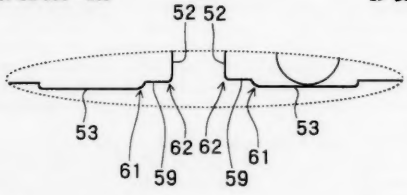
Kanji Kobayashi, Saku, and Masao Yamaguchi, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 23, 1998, Appl. No. 64,745

Claims priority, application Japan, Dec. 17, 1997, 9-347679; Apr. 15, 1998, 10-104236

Int. Cl.[7] G11B *5/60*

U.S. Cl. 360—103 **19 Claims**



1. A slider comprising:

a medium facing surface that faces toward a medium, a portion of the medium facing surface defining a protruding rail such that a medium facing surface of the rail forms part of the medium facing surface of the slider;

at least part of a lateral wall of the rail facing outward and being located closer to a center of the slider than a lateral wall of the slider;

first edges located between the medium facing surface of the rail and the outward facing lateral wall of the rail;

a second edge located closer to the lateral wall of the slider than the first edges;

at least the first edges and the second edge are blunt.

6,040,960

AIR DAMPER FOR DISC DRIVE ACTUATOR LATCH MECHANISM

Albert Michael Lindrose, Boulder, and Frederick Mark Stefansky, Longmont, both of Colo., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Provisional application No. 60/048,753, Jun. 3, 1997. This application Jun. 3, 1998, Appl. No. 89,677.

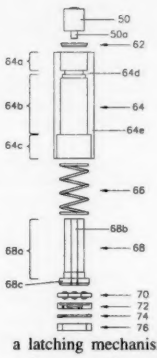
Int. Cl.[7] G11B *5/54*

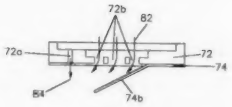
U.S. Cl. 360—105 **1 Claim**

1. A disc drive having a disc drive housing and an actuator for moving an array of heads relative to data recorded on a plurality of tracks on the surfaces of an array of discs, the actuator having a moving portion and the disc drive including a predetermined park location to which the moving portion of the actuator can be moved, the disc drive further comprising:

latching means for maintaining the actuator at the park location comprising

a latching feature carried on the moving portion of the actuator, and





a latching mechanism cooperating with the latching feature for generating a latching force which acts to hold the latching feature in contact with the latching mechanism, and

mounting means for mounting the latching mechanism and supporting the latching mechanism in relation to the disc drive housing and the moving portion of the actuator, the mounting means further comprising damping means for providing controlled, damped compliance in parallel with the latching force; said damping means comprising:

an outer can element fixed in relationship to the disc drive housing;

an inner can element axially movable within the outer can element;

bias means for maintaining the inner can element at a rest position relative to the outer can element, and;

a valve mechanism for controlling the flow of air into and out of a cavity formed between the inner and outer can elements by motion of the inner can element relative to the outer can element.

6,040,961

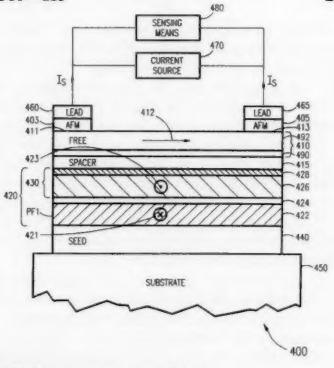
CURRENT-PINNED, CURRENT RESETTABLE SOFT AP-PINNED SPIN VALVE SENSOR

Hardayal Singh Gill, Portola Valley, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1997, Appl. No. 957,851

Int. Cl.[7] G11B *5/39*

U.S. Cl. 360—113 **20 Claims**



11. A disk drive system, comprising:

a magnetic recording disk;

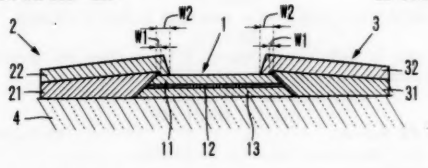
an anti-parallel (AP)-pinned spin valve (SV) sensor, comprising:
a free layer made of cobalt (Co) having a magnetization direction;
an AP-pinned layer, said AP-pinned layer including:
a first pinned layer of low coercivity ferromagnetic material;
a second pinned layer of ferromagnetic material comprising a first sub-layer of low coercivity material and a second sub-layer of high coercivity material, said second sub-layer coercivity being higher than said first sub-layer coercivity and said first pinned layer coercivity; and
an anti-parallel coupling layer disposed between said first pinned layer and said first sub-layer; and
a non-magnetic, electrically conducting spacer layer disposed between said free layer and said second sub-layer;
an actuator for moving said spin valve sensor across the magnetic recording disk so the spin valve sensor may access different regions of magnetically recorded data on the magnetic recording disk; and
means electrically coupled to the spin valve sensor for detecting changes in resistance of the sensor caused by rotation of the magnetization axis of the free ferromagnetic layer relative to the fixed magnetization direction of said AP-pinned layer in response to magnetic fields from the magnetically recorded data.

6,040,962

MAGNETORESISTIVE ELEMENT WITH CONDUCTIVE FILMS AND MAGNETIC DOMAIN FILMS OVERLAPPING A CENTRAL ACTIVE AREA

Kiyosumi Kanazawa, Nagano, and Yoshiro Nakagawa, Yamanashi, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 14, 1998, Appl. No. 78,484
Claims priority, application Japan, May 14, 1997, 9-124563
Int. Cl.[7] G11B *5/39*
U.S. Cl. 360—113 **22 Claims**



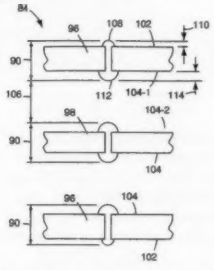
11. A thin film magnetic head including a magnetoresistive element comprising:
a central active area; and
passive areas provided at two side ends of said central active area, each passive area including a magnetic domain control film and a conductive film;
wherein said magnetic domain control film of each passive area partially overlaps the surface of said central active area, each conductive film is laminated onto a surface of a respective magnetic domain control film and overlaps surfaces of said respective magnetic domain control film and said central active area, and the degree to which said conductive films overlap said surface of said central active area is set larger than the degree to which said magnetic domain control films overlap said surface of said central active area.

6,040,963

FRINGE FIELD COMPENSATION SYSTEM FOR MULTI-TRACK SERVO RECORDING HEAD

Stephen J. Rothermel, Roseville, Minn., assignor to Imation Corp., Oakdale, Minn.

Continuation of application No. 08/900,523, Jul. 25, 1997, Pat. No. 5,959,812. This application Jun. 22, 1999, Appl. No. 337,233.
Int. Cl.[7] G11B *5/127;5/596*
U.S. Cl. 360—118 **31 Claims**



1. A method for recording a plurality of tracks of servo information longitudinally defined within a servo section of a magnetic recording medium, the method comprising:
writing a servo signal that extends substantially continuously over a width of the servo section along at least a portion of the magnetic recording medium;
providing an erase transducer that includes two or more erase elements, wherein each of the two or more erase elements has a predetermined width and is separated from any adjacent erase elements by a non-erasing portion, wherein the predetermined width of each of the two or more erase elements is less than a desired servo track pitch, wherein each erase element is operable to erase alternating portions of the servo signal in the servo section resulting in transitions between alternating erased portions and adjacent continuous servo signal, wherein such transitions define at least one of the plurality of tracks of servo information; and
repeatedly passing and stopping an erase current through an erase transducer to erase alternating portions of the servo signal in the servo section, wherein passing and stopping the erase current through the erase transducer includes controlling the amplitude of the erase current to control the fringe field effect between erase elements such that a width of the erased alternating portions matches the desired servo track pitch.

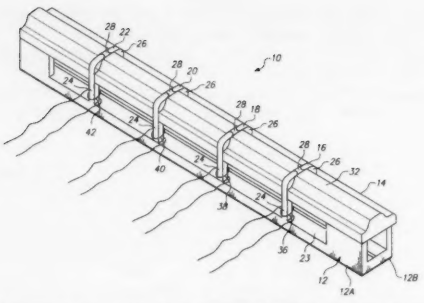
6,040,964

METHOD AND APPARATUS FOR MULTIPLE CHANNEL HEAD ASSEMBLY

George Saliba, Northborow, Mass., assignor to Quantum Corporation, Milpitas, Calif.

Continuation of application No. 08/507,618, Jul. 26, 1995, abandoned. This application Jul. 23, 1997, Appl. No. 899,082.
Int. Cl.[7] G11B *5/255;5/265*
U.S. Cl. 360—121 **4 Claims**

1. A magnetic recording head assembly comprising:
a core-bar of ferromagnetic material having a longitudinal axis;
the core bar defining a plurality of spaced apart magnetic transducer elements integrally fabricated therefrom, each said magnetic transducer element including:
a first pole segment defining a pole tip;
a second pole segment having a pole tip oppositely facing the pole tip of the first pole segment and separated by a narrow magnetic gap;
the magnetic gap between the pole tips being substantially aligned with the longitudinal axis of the core-bar and being filled with insulative material;
a coil of wire wound around at least one of the first and second pole segments;



a magnetic tape contacting structure defining longitudinal wear regions extending between the plurality of spaced-apart magnetic transducer elements, the magnetic tape contacting structure including laterally formed slots, each slot being formed between longitudinal wear regions, aligned with each transducer element, for receiving one of the transducer elements; and

end portions formed at opposing longitudinal ends of the core bar, each end portion having a top surface for registering and supporting the magnetic tape contacting structure.

6,040,965

THIN FILM MAGNETIC HEAD HAVING GROOVES WHICH BECOME GRADUALLY SHALLOWER

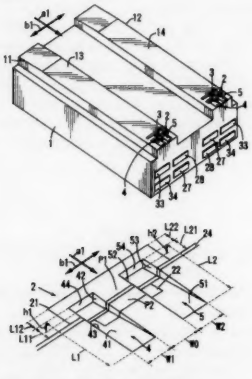
Koichi Terunuma, Hoya, and Akifumi Kamijima, Tokyo, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 27, 1997, Appl. No. 917,801

Claims priority, application Japan, Aug. 28, 1996, 8-227214

Int. Cl.[7] G11B *5/31*

U.S. Cl. 360—122 **18 Claims**



1. A thin film magnetic head comprising:

a slider having a leading edge and a trailing edge and having an air bearing surface; and

at least one inductive thin film magnetic conversion element disposed on said slider, and having first and second pole tips and a gap therebetween, the first pole tip being closer to the leading edge than the second pole tip, wherein:

a width of the gap in a direction perpendicular to a direction from the leading edge to the trailing edge of the slider is essentially defined by grooves formed in said air bearing surface, the grooves extending from within the first pole tip through the gap and towards the trailing edge; and

each of said grooves become gradually shallower along said direction from the leading edge of the groove to the trailing edge of the groove of said slider until a bottom surface of said grooves reaches flush with said air bearing surfaces at a region located passed the second pole tip.

6,040,966

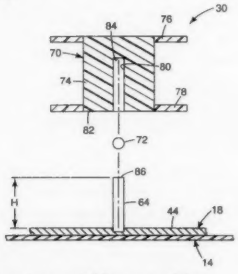
DATA STORAGE TAPE CARTRIDGE WITH HUB ALIGNMENT INSERT

Leif O. Erickson, Riverfalls, Wis., assignor to Imation Corp., Oakdale, Minn.

Filed Jun. 11, 1998, Appl. No. 96,019

Int. Cl.[7] G11B *23/087;23/037*

U.S. Cl. 360—132 **7 Claims**



1. A data storage tape cartridge comprising:

a housing defining a first housing section and a second housing section;

a hub pin attached to an interior surface of the first housing section, the hub pin extending in a generally perpendicular fashion from the interior surface and terminating in a leading end;

a tape reel assembly rotatably associated with the hub pin, the tape reel assembly comprising:

a tape reel including a hub and opposing flanges, the hub defining an axial bore extending from one end of the hub and terminating at an axial thrust surface, and

an insert selectively disposed within the axial bore, the insert abutting the axial thrust surface, wherein the hub pin is axially received within the axial bore such that the leading end of the hub pin abuts the insert; and

a storage tape maintained by the hub.

6,040,967

RESET LOCKOUT FOR CIRCUIT INTERRUPTING DEVICE

Nicholas L. DiSalvo, Levittown, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Aug. 24, 1998, Appl. No. 138,955

Int. Cl.[7] H02H *3/00*

U.S. Cl. 361—42 **18 Claims**

1. A circuit interrupting device comprising:

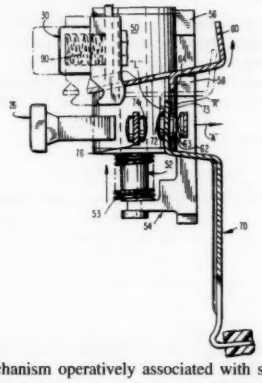
a housing;

at least one input conductor disposed at least partially within said housing and capable of being electrically connected to a source of electricity;

at least one output conductor disposed within said housing and capable of conducting electrical current to a load when electrically connected to said at least one input conductor;

a circuit interrupter disposed within said housing and configured to break said electrical connection between said input and output conductors in response to the occurrence of a predetermined condition;

a reset lock-out responsive to the occurrence of said predefined condition such that said reset lock-out is operable between a lock-out position wherein said reset lock-out inhibits resetting of said electrical connection between said input and output conductors and a reset position wherein said reset lock-out does not inhibit resetting of said electrical connection between said input and output conductors; and



a reset mechanism operatively associated with said reset lock-out and said circuit interrupter such that activation of said reset mechanism activates said circuit interrupter which facilitates movement of said reset lock-out from said lock-out position to said reset position by said reset mechanism.

6,040,968

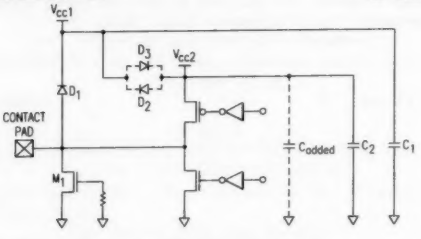
EOS/ESD PROTECTION FOR HIGH DENSITY INTEGRATED CIRCUITS

Charvaka Duvvury; E. Ajith Amerasekera, both of Plano, and Sridhar Ramaswamy, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/051,324, Jun. 30, 1997. This application Jun. 17, 1998, Appl. No. 99,654.

Int. Cl.[7] H02H *9/00*

U.S. Cl. 361—56 **29 Claims**



1. An integrated circuit structure, comprising:

a semiconductor substrate having:

a plurality of contact pads including a first contact pad for connection to a first external power supply voltage;

an overvoltage protection circuit for said integrated circuit structure operatively connected to said first contact pad; and

a power supply line connected to said overvoltage protection circuit and to said first contact pad to supply power to internal circuitry of said integrated circuit; said power supply line disposed over a predetermined portion of said substrate to provide a distributed capacitor in conjunction with said predetermined portion of said substrate to increase the capacitance between said power supply line and said substrate, said distributed capacitor delaying the rise in transient voltage levels and also reducing voltage supply noise when a voltage transient appears at said first contact pad.

6,040,969

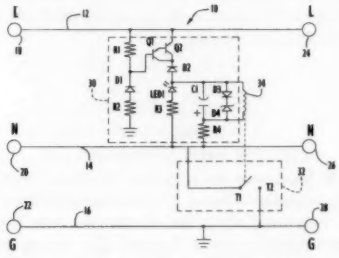
POWER FILTER CIRCUIT RESPONSIVE TO SUPPLY SYSTEM FAULT CONDITIONS

Peter G. Winch, Raleigh, N.C., and Richard Billingsley, Rossland, Canada, assignors to Electronic Systems Protection, Inc., Zebulon, N.C.

Filed Aug. 4, 1998, Appl. No. 128,435

Int. Cl.[7] H02H *3/18*

U.S. Cl. 361—82 **36 Claims**



1. A circuit for controlling electromagnetic interference, comprising:

a line conductor, a neutral conductor and a ground conductor, each connectable to a load and to a supply system having line, neutral and ground connectors, to provide an electrical connection between the supply system and the load;

a wiring fault condition sensing circuit connected to said line conductor, said neutral conductor and said ground conductor, said sensing circuit being configured to determine whether the line, neutral and ground connectors of the supply system are correctly wired and connected; and

a switch activated by said sensing circuit to form a short circuit between said neutral conductor and said ground conductor, irrespective of a voltage level appearing across said neutral conductor and said ground conductor, when all of the line, neutral and ground connectors of the supply system are correctly wired and connected.

6,040,970

INTERRUPTER UNIT OF A HIGH-VOLTAGE POWER CIRCUIT BREAKER

Volker Lehmann, Trevenbrietzen, and Joachim Gericke, Berlin, both of Germany, assignors to Siemens AG, Munich, Germany

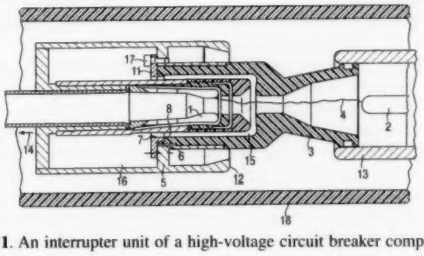
PCT No. PCT/DE97/00824, § 371 Date Feb. 16, 1999, § 102(e) Date Feb. 16, 1999, PCT Pub. No. WO97/40507, PCT Pub. Date Oct. 30, 1997

PCT Filed Apr. 22, 1997, Appl. No. 171,684

Claims priority, application Germany, Apr. 22, 1996, 296 07 660 U

Int. Cl.[7] H01H *73/00*

U.S. Cl. 361—115 **2 Claims**



1. An interrupter unit of a high-voltage circuit breaker comprising:

a cylindrical component;

at least two arcing contacts;

a hollow cylindrical nozzle coupled to the cylindrical component for blowing out an arc that may form between the at least two arcing contacts, the nozzle being composed of an insulating material and including at least one of an internal thread and an external thread for coupling to the cylindrical component, the nozzle further including a lateral surface situated opposite the at least one of the internal thread and the external thread; and

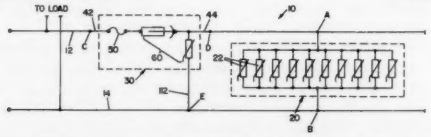
a connection piece connectable to the interrupter unit and supporting the nozzle on the lateral surface of the nozzle, a side of the connection piece having a knurling thereon for securing the nozzle against twisting.

6,040,971

CIRCUIT PROTECTION DEVICE

Kenneth R. Martenson, 54 High Rd., Newbury, Mass. 01951; Jerry L. Mosesian, 5 Russia St., Newburyport, Mass. 01950; Alan F. Wilkinson, 219 S. Rd., Kensington, N.H. 03827, and William Goldbach, 10490 Dunkirk Rd., Spring Hill, Fla. 34608

Filed Jun. 8, 1998, Appl. No. 93,367
Int. Cl.[7] H02H *1/00*
U.S. Cl. 361—118 **12 Claims**



1. A voltage suppression device for suppressing voltage surges in an electrical circuit, said device comprised of:

a voltage sensitive element having a first surface and a second surface and a predetermined voltage rating across said first and second surfaces, said voltage sensitive element increasing in temperature as voltage applied across said first and second surfaces exceeds said voltage rating;

a first terminal electrically connected to said first surface of said voltage sensitive element, said first terminal being connectable to a ground or neutral line;

a thermal element electrically connected to said second surface of said voltage sensitive element, said thermal element being an electrically conductive solid at room temperature and having a predetermined softening temperature;

a second terminal and a third terminal in electrical connection with said thermal element, said second terminal and said third terminal being connectable to an electrical power line and forming an electrical current path, said voltage sensitive element sensing the voltage drop between said electrical current path and said first terminal; and,

at least one terminal of said second and third terminals being, comprised of:

a) a conductive sleeve, one end of said sleeve being adjacent said voltage sensitive element,

b) an electrically conductive plunger within said sleeve, said plunger being secured to said voltage sensitive element by said thermal element, and

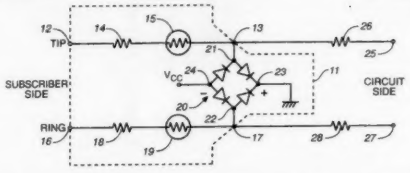
c) biasing means disposed between said sleeve and said plunger for biasing said plunger away from said voltage sensitive element, wherein said plunger moves away from electrical contact with said thermal element and breaks said electrical current path if an over-voltage condition sensed by said voltage sensitive element exceeds the voltage rating of said voltage sensitive element and causes said voltage sensitive element to heat said thermal element beyond its softening point.

6,040,972

PROTECTION DEVICE FOR COMMUNICATION

Haruyuki Takeuchi, Ishikawa-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Oct. 10, 1997, Appl. No. 948,862
Claims priority, application Japan, Oct. 22, 1996, 8-279073
Int. Cl.[7] H02H *3/22*
U.S. Cl. 361—119 **19 Claims**



1. A protection device for a communication system having a subscriber side and a circuit side adjacent each other, said protection device comprising:

protection circuit part entirely within said subscriber side serving to protect protection-requiring devices within said circuit side against an abnormal electrical condition occurring inside said subscriber side, said protection circuit including overcurrent-protecting elements, said overcurrent-protecting elements including at least thermistors having positive temperature characteristic or protection resistors; and

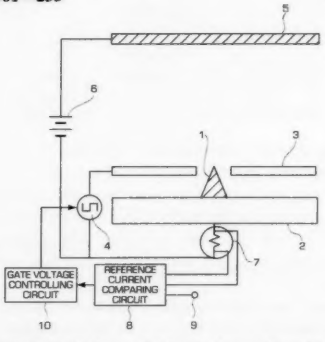
trimmable resistors which are within said circuit side and are connected between said protection circuit part and said protection-requiring devices for being trimmed such that resistance values of series connections of said trimmable resistors and said overcurrent-protecting elements can be changed to specified values.

6,040,973

METHOD OF DRIVING A FIELD EMISSION COLD CATHODE DEVICE AND A FIELD EMISSION COLD CATHODE ELECTRON GUN

Akihiko Okamoto, and Fuminori Ito, both of Tokyo, Japan, assignors to NEC Corporaiton, Tokyo, Japan

Filed Jan. 28, 1998, Appl. No. 14,577
Claims priority, application Japan, Jan. 28, 1997, 9-013923
Int. Cl.[7] G09G *3/10*
U.S. Cl. 361—235 **9 Claims**



1. A method of driving a field emission cold cathode device comprising the step of:

applying a positive voltage with reference to OV to a gate electrode disposed near an emitter; and

applying a negative voltage with reference to OV to the gate electrode at a predetermined time alternately with said positive voltage;

establishing said negative voltage in order to satisfy the relationship:

$V_f < V_r$

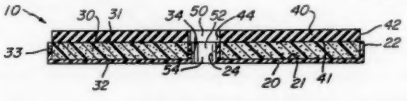
where V_f represents the absolute value of said positive voltage and V_r the absolute value of said negative voltage, wherein said alternatively applied positive and negative voltages maintain a substantially constant emission current from said emitter.

6,040,974

CAPACITOR COVER

Steven A. Rubin, Sharon, Mass., assignor to Universal Products, Inc., Brockton, Mass.

Filed Jul. 19, 1994, Appl. No. 277,330
Int. Cl.[7] H01G *9/10*
U.S. Cl. 361—519 **28 Claims**



1. A capacitor cover for closing an open end of a capacitor containing electrolyte, comprising:

an elastomeric outer layer having an inner surface and a first aperture,

a rigid middle layer having an outer surface, an inner surface, a peripheral surface, a second aperture and an annular surface defining said second aperture,

a polypropylene inner layer having an outer surface, a peripheral skirt, a third aperture and an annular skirt disposed around said third aperture,

said inner surface of said elastomeric outer layer being in contact with said outer surface of said rigid middle layer and said inner surface of said rigid middle layer being in contact with said outer surface of said polypropylene inner layer,

said first, second and third apertures disposed so as to allow passage of a terminal through said capacitor cover,

said peripheral skirt extending sufficiently to prevent said electrolyte of said capacitor from coming into contact with said peripheral surface of said rigid middle layer, and

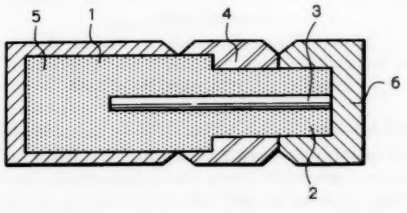
said annular skirt extending into said second aperture sufficiently to prevent said electrolyte of said capacitor from coming into contact with said annular surface of said rigid middle layer.

6,040,975

TANTALUM POWDER AND SOLID ELECTROLYTIC CAPACITOR USING THE SAME

Kazuya Mimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1998, Appl. No. 105,482
Claims priority, application Japan, Jun. 30, 1997, 9-173660
Int. Cl.[7] H01G *9/042*
U.S. Cl. 361—523 **4 Claims**



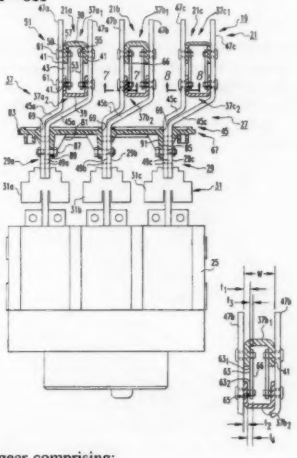
2. In a solid electrolytic capacitor, an anode body is produced by sintering tantalum powder consisting of raw powder having a CV value greater than 40,000 μF FV/g inclusive and cohered powder having a grain size ranging from 40 μm to 200 μm and added to said raw powder in an amount of 2 wt % to 5 wt %.

6,040,976

SWITCHGEAR CONDUCTORS AND MOUNTING ARRANGEMENTS THEREFOR

Rodney William Bruner, and William Edward Wilkie, II, both of Fletcher, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 9, 1998, Appl. No. 188,721
Int. Cl.[7] H02B *1/20*
U.S. Cl. 361—611 **16 Claims**



1. Switchgear comprising:

a cabinet;

at least one electrical apparatus mounted in said cabinet;

a set of risers vertically mounted in said cabinet and each comprising a pair of confronting electrically conductive U-channels;

stab members; and

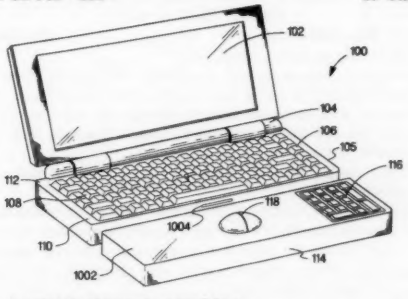
mounting means mounting said stab members to project laterally from at least some of said risers in alignment for engagement with said at least one electrical apparatus to electrically connect said at least one electrical apparatus to said at least some risers.

6,040,977

PALM REST FOR A KEYBOARD OR A PORTABLE COMPUTER HAVING A NUMERIC KEYPAD

Cary J. Hoffer, Albany, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 30, 1998, Appl. No. 183,067
Int. Cl.[7] G06F *1/16*
U.S. Cl. 361—680 **23 Claims**



1. A portable computer, comprising:

a base having a keyboard on an upper surface and having a front portion and a rear portion;

a display connected to said base;

a palm rest disposed across said front portion of said base, said palm rest having a top surface and an inner surface, wherein said palmrest is detachably connected to said base through a connection device; and

said palm rest further comprising a numeric keypad in communication with the computer through said connection device.

6,040,978

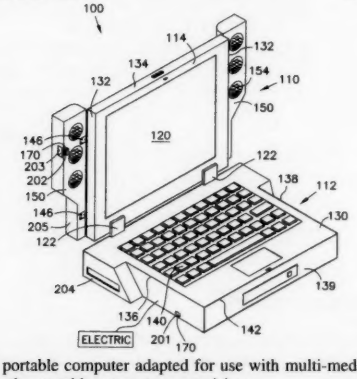
PORTABLE COMPUTER HAVING FOLDING SPEAKERS

Julian A. Q. Spencer, Vermillion, S. Dak., assignor to Gateway 2000, Inc., North Sioux City, S. Dak.

Filed Nov. 26, 1997, Appl. No. 978,909

Int. Cl.[7] **G06F** *1/16;* **H05K** *7/16*

U.S. Cl. 361—683 **12 Claims**



1. A portable computer adapted for use with multi-media applications, the portable computer comprising:

a computer body having a front portion and two side surfaces;

a processor and a memory encompassed by the computer body;

a display rotatably coupled with the computer body;

at least one speaker panel coupled proximate to the display;

at least one audio output device disposed within the at least one speaker panel; and

an opening device operatively coupled with a at least one speaker panel and the computer body for moving the at least one speaker panel from a closed position to an open position.

6,040,979

COMPUTER HAVING MODULE BAY WITH VARIABLE INSERTION OPENING SIZE

Steven S. Homer, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 18, 1998, Appl. No. 25,411

Int. Cl.[7] **G06F** *1/16*

U.S. Cl. 361—683 **13 Claims**

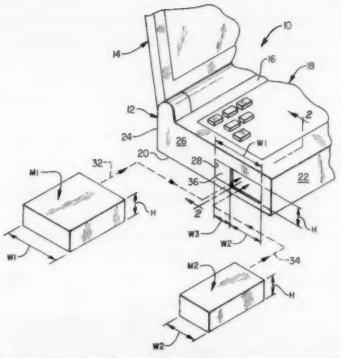
1. Electronic apparatus comprising:

a housing having an internal area and a wall opening inwardly through which a device may be operatively inserted into said internal area; electronic circuitry operatively disposed within said housing and being electronically mateable with the inserted device; and

a single closure member carried by said housing at said wall opening and being:

(1) resiliently biased toward a first position in which said closure member blocks only a portion of said wall opening and leaves an unblocked portion of said wall opening constituting a major portion and essentially the entire remainder thereof; and

(2) inwardly deflectable to a second position by a device operatively inserted through said wall opening and having a cross-sectional area greater than the unblocked area of said wall opening,



said closure member being pivotable relative to said housing between said first and second positions.

8. A portable computer comprising:

a base housing having an exterior wall section in which a module insertion opening is formed, and an internal bay area adapted to interchangeably receive first and second modular devices inserted inwardly through said module insertion opening, the first modular device having a cross-sectional area greater than that of the second modular device;

electronic circuitry operatively disposed within said bay area and being electronically mateable with the inserted first and second modular devices; and

a single closure member carried by said base housing at said module insertion opening for movement relative to said base housing between:

a first position in which said closure member extends across and blocks only a first portion of said module insertion opening and leaves unblocked a second major portion thereof, which constitutes essentially the entire remainder of said module insertion opening, through which the second modular device may be inserted into said bay area, and

a second position in which, in response to insertion of the first modular device through said module insertion opening into said bay area, said closure member is deflected away from said first portion of said module insertion opening; and

a biasing structure operative to resiliently bias said closure member toward said first position thereof,

said closure member being pivotable relative to said base housing between said first and second positions.

6,040,980

DISK DRIVE TO CHASSIS MOUNTING APPARATUS AND METHOD

Greg P. Johnson, Boise, Id., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Oct. 21, 1998, Appl. No. 177,698

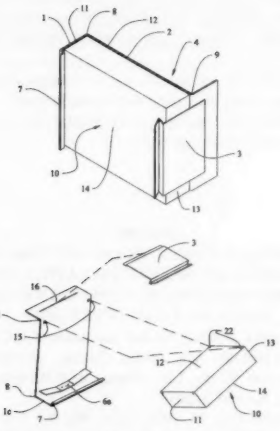
Int. Cl.[7] **H05K** *5/00;7/00*

U.S. Cl. 361—685 **30 Claims**

1. An apparatus for mounting a disk drive, the disk drive having a first side, a second side, a third side, and a fourth side, the first side being opposite the third side and the second side being opposite the fourth side, the first side having a first hole and the second side having a second hole, the apparatus comprising:

a first member having a first shear connector for engaging the first hole;

a second member, coupled to said first member; and



a deformable member with surfaces to engage the third and fourth sides of the disk drive,

said deformable member coupled to said second member.

6,040,981

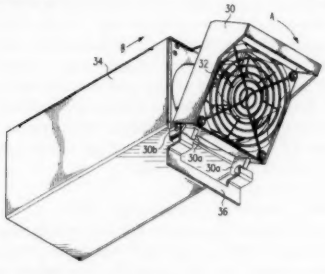
METHOD AND APPARATUS FOR A POWER SUPPLY CAM WITH INTEGRATED COOLING FAN

Ty Schmitt, Round Rock, and Vibora Sim, Pflugerville, both of Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Jan. 26, 1999, Appl. No. 237,635

Int. Cl.[7] **H05K** *7/20*

U.S. Cl. 361—695 **19 Claims**



1. A computer system comprising:

a chassis,

a power supply for mounting in the chassis,

a fan for cooling the power supply, and

a camming handle for supporting the fan, wherein the camming handle is connected to the power supply and is moveable between an open and a closed position, the camming handle including a portion for engaging the chassis, wherein movement of the camming handle to the closed position causes the power supply to be translated to an engaged position relative to the chassis and causes the fan to be aligned into a cooling position relative to the power supply.

6,040,982

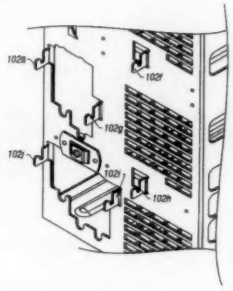
ELECTRONIC SYSTEM IMPLEMENTING REDUNDANT AND NONREDUNDANT POWER SUPPLY CONFIGURATIONS

Jerry D. Gandre; Steven L. Sands; R. Steven Mills, and Arthur Lopez, all of Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Oct. 16, 1997, Appl. No. 951,798

Int. Cl.[7] **G06F** *1/16;* **H05K** *7/20*

U.S. Cl. 361—724 **40 Claims**



16. An apparatus comprising:

a chassis having a support frame that includes attachment features which interchangeably receive: (i) a connector assembly which connects to a first power supply in a nonredundant power supply configuration and (ii) a current sharing circuit board which connects to a plurality of power supplies in a multiple power supply configuration.

6,040,983

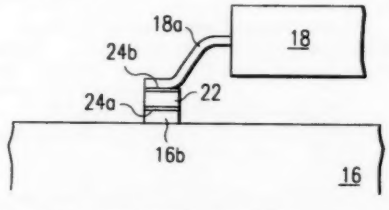
VERTICAL PASSIVE COMPONENTS FOR SURFACE MOUNT ASSEMBLY

Daniel Baudouin, Missouri City; Ernest J. Russell, Richmond, and Jeffrey W. Janzen, Missouri City, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/043,101, Apr. 16, 1997. This application Mar. 13, 1998, Appl. No. 41,902.

Int. Cl.[7] **H05K** *7/02*

U.S. Cl. 361—760 **4 Claims**



1. A surface mounted assembly, comprising:

a printed wiring board having a solder pad on a surface thereof;

an active integrated circuit device having a lead finger disposed over the solder pad; and

a passive device having a first end and a second end that is disposed between the solder pad and the lead finger with the first end attached to the solder pad on the surface of the printed wiring board and the second end attached to the lead finger of the active integrated circuit device.

6,040,984

PRINTED CIRCUIT BOARD WITH OPPOSED BONDING SHELVES FOR SEMICONDUCTOR CHIP WIRE BONDING AT DIFFERENT LEVELS

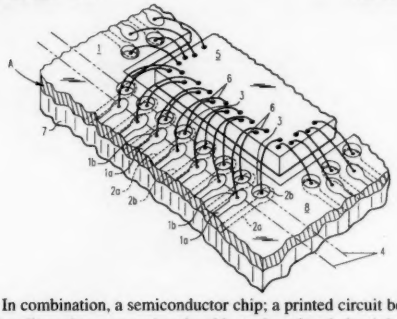
Tadashi Hirakawa, Osaka, Japan, assignor to Fuji Machinery Mfg. & Electronics Co., Ltd., Osaka, Japan

Filed Feb. 26, 1997, Appl. No. 805,175

Claims priority, application Japan, Feb. 27, 1996, 8-067258

Int. Cl.[7] H05K *7/02*

U.S. Cl. 361—777 **21 Claims**



1. In combination, a semiconductor chip; a printed circuit board; and bonding wires connecting the chip to the printed circuit board; said printed circuit board comprising a base material, a series of conductive traces of conductive foil on both sides of the base material, the traces on a first surface of the base material forming a first bonding shelf having first bonding pads, the traces on an opposite second surface of the base material forming a second bonding shelf having second bonding pads, said first and second bonding pads being located in rows adjacent to each other separated by said base material, a series of openings in said base material adjacent to said first bonding pads and each leading to a respective one of said second bonding pads on said second bonding shelf, and wherein the bonding wires are connectable directly from the chip to said first bonding pads on said first bonding shelf and through said openings to said second bonding pads on said second bonding shelf.

6,040,985

CIRCUIT BOARD HAVING GENERAL PURPOSE REGION AND PROGRAMMABLE REGION

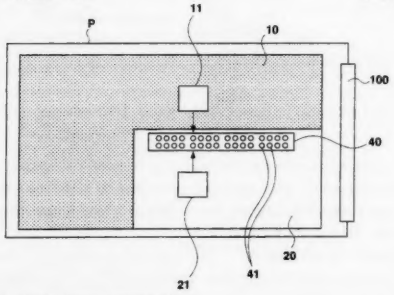
Masayuki Arai, Tokyo, and Seiji Kobayashi, Kanagawa, both of Japan, assignors to Sony Corporation, Japan

Filed Oct. 22, 1997, Appl. No. 955,495

Claims priority, application Japan, Oct. 23, 1996, P08-299365

Int. Cl.[7] H05K *7/06*

U.S. Cl. 361—780 **6 Claims**



1. A circuit board, comprising:

a general purpose region in which a general-purpose electrical part is mounted; and

a programmable region in which a programmable digital electrical part is mounted, said general-purpose region and said programmable region being provided on the same board, wherein

an interface means for electrically connecting said programmable region and said general-purpose region is disposed at the boundary area between said programmable region and said general-purpose region.

6,040,986

NON-CONTACT POWER TRANSMITTING DEVICE HAVING SIMPLIFIED SELF-OSCILLATION FEEDBACK LOOP WHICH INTERRUPTS POWER TRANSMISSION WHEN NO LOAD IS PRESENT

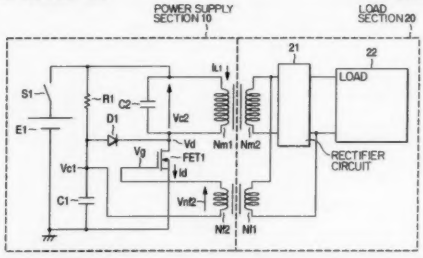
Hiroshi Sakamoto, 6-388-3, Tsuboi, Kumamoto-shi, kumamoto, Japan, and Hideaki Abe, Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, and Hiroshi Sakamoto, Kumamoto, both of Japan

Filed Nov. 27, 1998, Appl. No. 200,474

Claims priority, application Japan, Dec. 9, 1997, 9-339004

Int. Cl.[7] H02M *3/335*

U.S. Cl. 363—20 **5 Claims**



1. A non-contact power transmitting device comprising:

(A) a power supplying section comprising:

a voltage source;

a start resistor connected to said voltage source;

a first capacitor connected to said voltage source;

a power transmitting primary coil;

a signal transmitting secondary coil which is not inductively coupled to said power transmitting primary coil; and

a switching element having a control terminal, wherein, said start resistor and said first capacitor apply a bias voltage to said control terminal of said switching element, and when the bias voltage applied to said control terminal becomes higher than a threshold voltage, said switching element switches a current from said voltage source to said power transmitting primary coil; and

(B) a load section comprising:

a power transmitting secondary coil; and

a signal transmitting primary coil being electrically and magnetically coupled to said power transmitting secondary coil,

wherein, when said load section is attached to said power supplying section, said power transmitting primary coil and said power transmitting secondary coil are magnetically coupled to each other, so that power is transmitted from said power supplying section to said load section by electromagnetic induction,

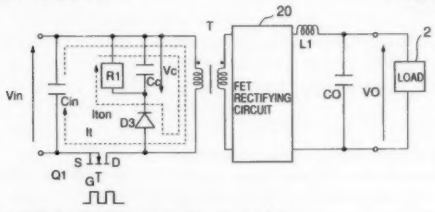
said signal transmitting secondary coil is magnetically coupled to said signal transmitting primary coil and electrically coupled to said control terminal as a feedback coil, and

said power transmitting primary coil, said power transmitting secondary coil, said signal transmitting primary coil, and said signal transmitting secondary coil form a feedback loop.

6,040,987
DC-DC CONVERTER UNIT

Kenji Kudo; Kohji Kuwabara; Shigeharu Yamashita; Kazutoshi Fuchigami, all of Kawasaki, and Norikazu Katsuyama, Fukuoka, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 1, 1998, Appl. No. 53,300
Claims priority, application Japan, Jul. 16, 1997, 9-190873
Int. Cl.[7] H02M *3/335*
U.S. Cl. 363—21 **7 Claims**



1. A DC—DC converter unit comprising:

a power conversion transformer;

a switching device switching a DC voltage supplied to a primary winding of said power conversion transformer;

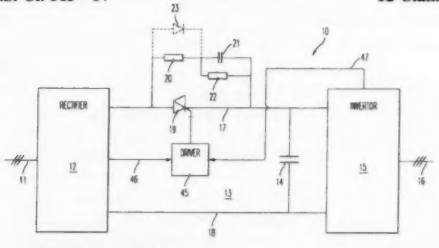
a synchronous rectifying circuit rectifying a AC voltage generated on a secondary winding of said power conversion transformer in synchronization with the switched DC voltage supplied to said primary winding of said power conversion transformer; and

a reset circuit for resetting excitation energy stored in said power conversion transformer by an on-operation of said switching device, a voltage generated in said primary winding of said power conversion transformer having a square waveform when said switching device is turned off.

6,040,988
CONVERTER WITH DC VOLTAGE INTERMEDIATE CIRCUIT AND METHOD FOR OPERATING SUCH A CONVERTER

Jochen Rees, Waldshut, and Jürgen Steinke, Albbruck, both of Germany, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Aug. 25, 1998, Appl. No. 139,125
Claims priority, application Germany, Aug. 25, 1997, 197 36 903
Int. Cl.[7] H02M *5/45;7/122*
U.S. Cl. 363—37 **12 Claims**



1. A converter comprising:

a rectifier circuit having an AC voltage input and a DC voltage output and configured to be connected to a power supply system;

an invertor circuit having a DC voltage input and an AC voltage output;

a DC voltage intermediate circuit arranged between the DC voltage output of the rectifier circuit and the DC voltage input of the inverter circuit; and

two connecting lines, leading from the DC voltage output of the rectifier circuit to the DC voltage input of the invertor circuit,

wherein the invertor comprises a three-point inverter with a center tap.

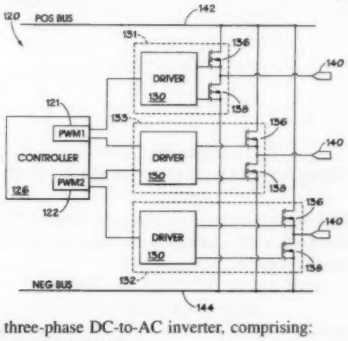
wherein intermediate circuit capacitors are respectively arranged between the center tap and each of the connecting lines, and

wherein in order to protect the converter in the event of a short circuit, first controllable semiconductor switches are arranged in each of the connecting lines between the DC voltage output of the rectifier circuit and a respective intermediate circuit capacitor.

6,040,989
DEVICE AND METHOD FOR GENERATING THREE-PHASE SINE WAVES USING TWO PULSE-WIDTH MODULATORS

J. Stephen Thorn, Florissant, and Arthur E. Woodward, Manchester, both of Mo., assignors to Emerson Electric Co, St. Louis, Mo.

Filed May 6, 1999, Appl. No. 306,614
Int. Cl.[7] H02M *1/12*
U.S. Cl. 363—41 **20 Claims**



15. A three-phase DC-to-AC inverter, comprising:

first, second and third legs;

a first PWM generator operable to provide an output to the first inverter leg during first and second 120° segments of a 360° electrical cycle, and provide an output to the third inverter leg during a third 120° segment; and

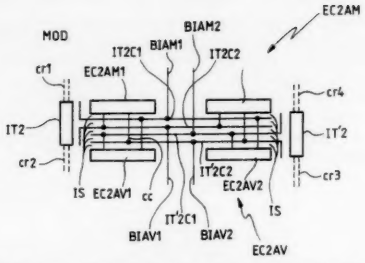
a second PWM generator operable to provide an output to the third inverter leg during the first 120° segment, and provide an output to the second inverter leg during the second and third 120° segments.

6,040,990
PRACTICAL STRUCTURE FOR MAKING A MULTILEVEL CONVERTER

Jacques Courault, Veneux les Sablons, France, assignor to Alstom, Paris, France

Filed Mar. 15, 1999, Appl. No. 267,369
Claims priority, application France, Mar. 16, 1998, 98 03189
Int. Cl.[7] H02M *3/18*
U.S. Cl. 363—59 **8 Claims**

1. A multilevel converter structure made up of cells in cascade, each intermediate cell containing two switches, with one pole of each of the two switches forming part of a pair of upstream poles and the other pole of each of the switches forming part of a pair of downstream poles, the pair of downstream poles of an upstream cell being connected to the pair of upstream poles of a downstream cell, the converter structure also having a respective capacitor for each cell, each capacitor being connected between the two poles constituting the pair of downstream poles of its cell, wherein said converter structure is made up of modules, among which at least an intermediate module contains an upstream capacitor element, in



addition to two switches corresponding to the switches of an intermediate cell, the capacitance of said capacitor element being a fraction of the capacitance of the cell capacitor of said upstream cell, while a module upstream from said intermediate module contains a downstream capacitor element whose capacitance is a second fraction of the capacitance of the cell capacitor of said upstream cell.

6,040,991

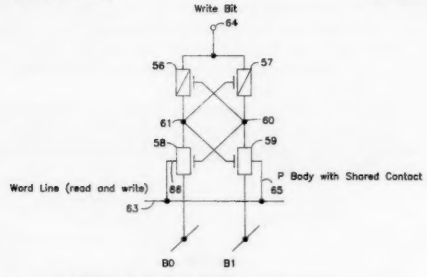
SRAM MEMORY CELL HAVING REDUCED SURFACE AREA

John J. Ellis-Monaghan, Grand Isle, and Wilbur D. Pricer, Charlotte, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1999, Appl. No. 225,074

Int. Cl.[7] G11C *11/00*

U.S. Cl. 365—154 **23 Claims**



1. A static RAM cell comprising:

first pair of transistors, each of said transistors including a source, a drain, a gate and a body contact for controlling conduction of a respective transistor;

a second pair of transistors having drain connections connected to drain connections of said first pair of transistors, and having source connections connected together, each of said pairs of transistors having gate connections cross coupled to drains of an opposite transistor of a respective pair of transistors to form a bistable latch;

a pair of complementary bit lines connected to the source connections of said first pair of transistors having said body contact;

a word line connected to the body contact of each transistor having said body contact; and

a write terminal connected to said source connections of said second pair of transistors.

6,040,992

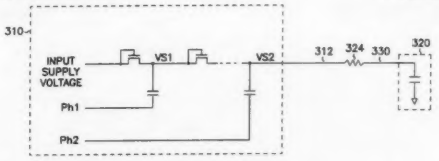
INTEGRATED CIRCUIT CHARGE COUPLING CIRCUIT

Christophe J. Chevallier, Palo Alto, Calif., assignor to Micron Technology, Inc., Boise, Id.

Continuation of application No. 09/001,793, Dec. 31, 1997, Pat. No. 5,949,708. This application Jul. 12, 1999, Appl. No. 351,940.

Int. Cl.[7] G11C *11/34*

U.S. Cl. 365—183 **16 Claims**



1. A flash memory device comprising:

a connection for receiving a supply voltage which is below approximately 3.6 volts during normal operations;

an array of non-volatile memory cells comprising a plurality of substantially capacitive word lines for accessing the memory cells;

a charge pump for producing an output voltage selectively coupled to the plurality of word lines, the charge pump comprising a plurality of serially connected transistors configured to operate as diodes and a plurality of pump capacitors, one of the pump capacitors is coupled to an output connection of the charge pump; and

a coupling resistor circuit, having no diodes or transistors, connected between the output connection of the charge pump and one of the word lines.

6,040,993

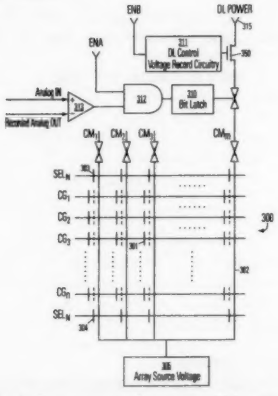
METHOD FOR PROGRAMMING AN ANALOG/MULTI-LEVEL FLASH EEPROM

Chia-Hsing Chen, I-Lan Hsian, and Mam-Tsung Wang, Hsinchu, both of Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Feb. 23, 1998, Appl. No. 28,229

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—185.03 **33 Claims**



1. A method for programming a multi-level floating gate memory cell, comprising the steps of:

searching a program data-line voltage of the cell and ascertaining that said program data-line voltage is less than a first program verification margin for each data-line of the cell by using a first number of program pulse shots having a first pulse width and a second number of program pulse shots having a second pulse width and recording the program data-line voltage of the cell;

using the recorded program data-line voltage for each bit-line and page programming the cell using a third number of program pulse shots having a third pulse width until the cell has less than a second program verification margin;

determining whether the cell is programmed within the second program verification margin; and if not

iteratively applying another program retry pulse to the cell and determining whether the cell is programmed, until the cell is programmed within the second program verification margin or a maximum number, M, of retries is made;

using the recorded data-line voltage for each bit-line and page programming the cell using a fourth number of program pulses having a fourth pulse width until the cell has less than a third program verification margin;

determining whether the cell is programmed within the third program verification margin; and if not

iteratively applying another program retry pulse to the cell and determining whether the cell is programmed, until the cell is programmed within the third program verification margin or a maximum number, N, of retries is made.

6,040,994

METHOD FOR WRITING IN AN ELECTRICALLY MODIFIABLE NON-VOLATILE MEMORY

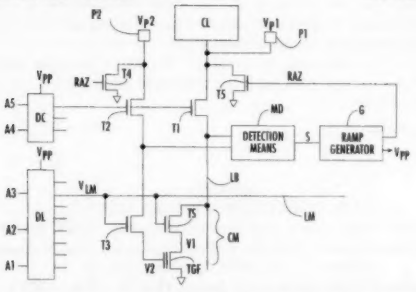
David Naura, Aix en Provence, France, assignor to STMicroelectronics S.A., Gentilly, France

Filed Oct. 27, 1998, Appl. No. 179,621

Claims priority, application France, Oct. 28, 1997, 97 13740

Int. Cl.[7] G11C *16/00*

U.S. Cl. 365—185.18 **34 Claims**



17. An electrically modifiable non-volatile memory device comprising:

an array of memory cells that are read addressable and write addressable byword lines and bit lines, each memory cell comprising a selection transistor and a floating gate transistor series-connected with the selection transistor between a bit line and ground; and

a voltage generator for the simultaneous generation of a first voltage signal for selecting a memory cell and a second voltage signal when the selected memory cell is to be erased, the first voltage signal being applied to the word line connected to the memory cell to be selected and the second voltage signal being applied to a gate of the floating-gate transistor, the two voltage signals each comprising a rising phase, a voltage plateau and a voltage drop;

said voltage generator further comprising means for holding a duration of the voltage plateau of the first voltage signal for a time t1 measured from a starting point of the rising phase, which is greater than a corresponding duration time t2 for the second voltage signal.

6,040,995

METHOD OF OPERATING A STORAGE CELL ARRANGEMENT

Hans Reisinger, Grünwald, Germany; Ulrike Grüning, Hopewell Junction, N.Y.; Hermann Wendt, Grasbrunn, Germany; Reinhard Stengl, Stadtbergen, Germany; Volker Lehmann, München, Germany; Josef Willer, Riemerling, Germany; Martin Franosch, München, Germany; Herbert Schäfer, Höhenkirchen-Siegertsbrunn, Germany; Wolfgang Krautschneider, Hohenthann, Germany; Franz Hofmann, München, Germany, and Thomas Böhm, Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

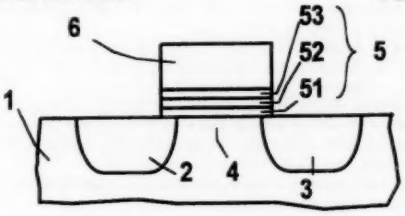
PCT No. PCT/DE97/01601, § 371 Date Jan. 28, 1999, § 102(e) Date Jan. 28, 1999, PCT Pub. No. WO98/06140, PCT Pub. Date Feb. 12, 1998

PCT Filed Jul. 29, 1997, Appl. No. 230,614

Claims priority, application Germany, Aug. 1, 1996, 196 31 155

Int. Cl.[7] H01L *27/02*

U.S. Cl. 365—185.18 **4 Claims**



1. A method for operating a memory cell arrangement, comprising the steps of:

using MOS transistors each having a dielectric triple layer with a first silicon oxide layer, a silicon nitride layer and a second silicon oxide layer as gate dielectric, as memory cells, the first silicon oxide layer and the second silicon oxide layer being respectively at least 3 nm thick;

applying, for writing a first logical value into one of the memory cells, a first charge amount onto the gate dielectric by Fowler-Nordheim tunneling, said first charge amount being stored in the gate dielectric thereby effecting a first cutoff voltage value of the MOS transistor;

applying for writing a second logical value into one of the memory cells, a second charge amount onto the gate dielectric by Fowler-Nordheim tunneling, said second charge amount being stored in the gate dielectric thereby effecting a second cutoff voltage value of the MOS transistor;

applying, for readout of digital information from one of the memory cells, a read voltage to the gate electrode of the memory cell, said read voltage lying between the first cutoff voltage value and the second cutoff voltage value, the read voltage being evaluated as to whether a current flows through the MOS transistor or not.

6,040,996

CONSTANT CURRENT PROGRAMMING WAVEFORMS FOR NON-VOLATILE MEMORIES

Sik On Kong, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing, Ltd., Singapore, Singapore

Filed Nov. 16, 1998, Appl. No. 192,337

Int. Cl.[7] G11C *16/04*

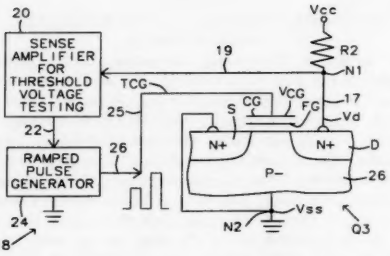
U.S. Cl. 365—185.19 **20 Claims**

11. An EEPROM memory device comprising:

a substrate on which a gate electrode stack is formed on a doped silicon semiconductor material, said gate electrode stack including a tunnel oxide layer,

a floating gate electrode and a control gate electrode,

a dielectric layer between said floating gate electrode and said control gate electrode,



a source region and a drain region formed in said substrate self-aligned with said stack, said source region being at a source voltage V_S,

a supply voltage V_{cc} being connected through a resistor to said drain region and said source region being connected to ground voltage V_{ss},

said drain region being at a drain voltage V_D and said substrate being at a substrate voltage V_{Sub},

means for writing data to said floating gate electrode by applying an upwardly stepwise increasing control gate voltage V_{CG1} waveform to said control gate electrode of said EEPROM device with a voltage ramp having a substantially constant tunneling current into said floating gate electrode, wherein said substantially constant tunnelling current is substantially constant with respect to time,

means for providing measurements of said drain voltage V_D with a voltage sensing testing device, and

means for adjusting said upwardly stepwise increasing control gate voltage as a function of said measurements of said drain voltage V_D,

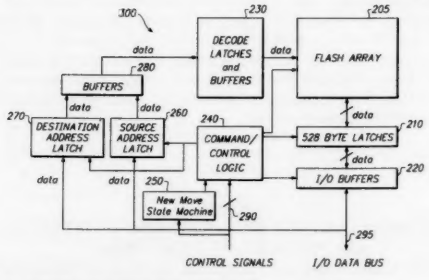
whereby programming speed and the number of write/erase cycles is increased.

6,040,997

FLASH MEMORY LEVELING ARCHITECTURE HAVING NO EXTERNAL LATCH

Petro Estakhri, Pleasanton, Calif., assignor to Lexar Media, Inc., Fremont, Calif.

Filed Mar. 25, 1998, Appl. No. 47,798
Int. Cl.[7] G11C *11/34*
U.S. Cl. 365—185.33 **15 Claims**



1. A flash memory system comprising:

a. a flash array for storing data;

b. a plurality of internal latches coupled to the flash array for temporarily holding the data;

c. a controller coupled to the flash array and the plurality of internal latches configured to transfer the data stored in a source address of the flash array to the plurality of internal latches and then directly transferring the data, to a destination address in the flash array without utilizing an external memory device, wherein the external memory device is external from the flash memory system; and

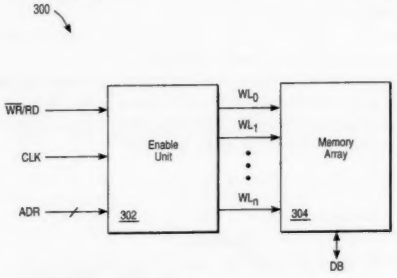
d. a locator device configured to search within the flash array for a free memory block for use as the destination address.

6,040,998

MEMORY ACTIVATION DEVICES AND METHODS

Chih-Ta Star Sung, Princeton, N.J.; Venkat Mattela, San Jose, Calif.; Muhammad Afsar, San Diego, Calif.; Balraj Singh, and Chih-Teng Hung, both of San Jose, Calif., assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 11, 1998, Appl. No. 132,559
Int. Cl.[7] G11C *7/00;8/00*
U.S. Cl. 365—194 **21 Claims**



1. A memory device comprising:

an enable unit arranged to receive a plurality of address signals and a clock signal and to output an activation signal, at least one of the address signals being characterized by a worst case delay relative to a first transition of the clock signal, the enable unit being further arranged to generate an enable signal which follows the first transition of the clock signal by at least about the worst case delay and which occurs before a next transition of the clock signal, the enable signal being for controlling the activation signal; and

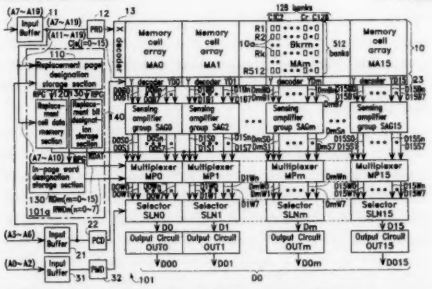
a memory array arranged to receive the activation signal such that a memory location corresponding to the activation signal is activated.

6,040,999

SEMICONDUCTOR MEMORY DEVICE

Yasuhiro Hotta, Nara, and Shuichiro Kouchi, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1997, Appl. No. 954,174
Claims priority, application Japan, Oct. 24, 1996, 8-282767
Int. Cl.[7] G11C *7/00;8/00*
U.S. Cl. 365—200 **10 Claims**



1. A semiconductor memory device, comprising:

a main memory section for storing data, the main memory section including a plurality of memory cells arranged in a matrix;

a redundant memory section including a replacement cell data memory section for storing replacement cell data to replace

cell data in a prescribed memory cell in the main memory section, and a control signal generation section for generating a control signal for data replacement based on an input address;

a memory cell selection section for simultaneously selecting prescribed cells as a plurality of memory cells corresponding to a prescribed page in the main memory section based on the input address;

a sensing amplification section for simultaneously sensing the cell data corresponding to the selected plurality of memory cells as page data;

a data replacement section for receiving the replacement cell data and the control signal from the redundant memory section and also receiving the page data from the sensing amplification device; when the page data includes cell data which needs to be replaced, outputting replacement page data after replacing the cell data with the replacement cell data based on the control signal; and when the page data includes no cell data which needs to be replaced, outputting the page data with no processing based on the control signal; and

a data selection section for sequentially switching and outputting the corresponding data from the page data output from the data replacement section based on the input address,

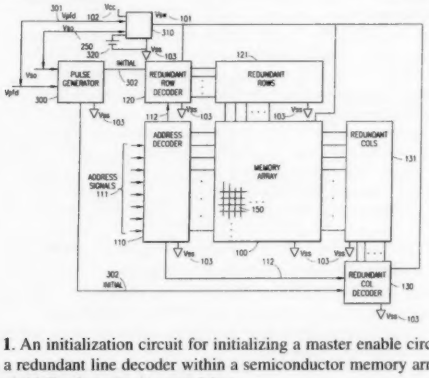
wherein a supply of the replacement cell data and the control signal from the redundant memory section to the data replacement section is performed in a time period from the time when the input address is determined until the time when the page data to be output from the sensing amplification section is determined.

6,041,000

INITIALIZATION FOR FUSE CONTROL

David C. McClure, Carrollton, and Tom Youssef, Dallas, both of Tex., assignors to STMicroelectronics, Inc., Carrollton, Tex.

Filed Oct. 30, 1998, Appl. No. 183,840
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—200 **16 Claims**



1. An initialization circuit for initializing a master enable circuit in a redundant line decoder within a semiconductor memory array, the initialization circuit comprising:

voltage sensing and switching circuit for determining that a predetermined voltage level has been reached and for multiplexing a plurality of power sources to a single power bus for the semiconductor memory array, and

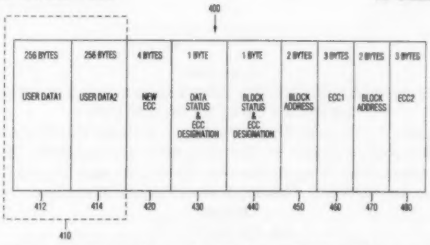
a pulse generation circuit for generating an initialization pulse responsive to the predetermined voltage level being reached, the initialization pulse for initializing the master enable circuit to a known state in order to minimize undesirable currents within the semiconductor memory array, said master enable circuit being connected to said single power bus.

6,041,001

METHOD OF INCREASING DATA RELIABILITY OF A FLASH MEMORY DEVICE WITHOUT COMPROMISING COMPATIBILITY

Petro Estakhri, Pleasanton, Calif., assignor to Lexar Media, Inc., Fremont, Calif.

Filed Feb. 25, 1999, Appl. No. 258,163
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—200 **41 Claims**



17. A controller for increasing the data reliability of a memory device without compromising compatibility, the controller comprising:

a. means for decoding a predetermined bit located in a predetermined location within the memory device, the predetermined bit holding a data reliability procedure code; and

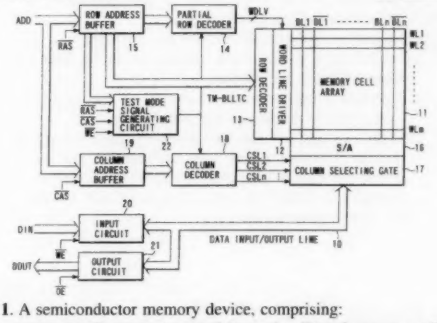
b. means for performing a data reliability procedure corresponding to the data reliability procedure code on a data bit, the means for performing the data reliability procedure being coupled to the means for decoding the predetermined bit.

6,041,002

SEMICONDUCTOR MEMORY DEVICE AND METHOD OF TESTING THE SAME

Hiroshi Maejima, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1998, Appl. No. 196,192
Claims priority, application Japan, Nov. 21, 1997, 9-321199
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—201 **10 Claims**



1. A semiconductor memory device, comprising:

a memory cell array structured by a plurality of memory cells disposed in a row and column matrix shape, each memory cell being connected to a bit line and a word line;

a row decoder for selecting one word line from said plurality of word lines based on an address signal from outside;

a non-selective state setting circuit for setting all of said plurality of word lines to a non-selective state according to test mode signal;

a column decoder for selecting a column from which data is to be read and into which data is to be written, from a plurality of columns within said memory cell array based on the address signal from outside;

a data input and output line used for data input and output between said memory cell array and an external terminal and for being connected to a bit line of a selected column;

a selective-state setting circuit for setting all of said plurality of columns within said memory cell array to a selective-state according to said test mode signal; and

test mode signal generating circuit for generating said test mode signal in test mode for testing a leakage of a charge held in a memory cell.

6,041,003

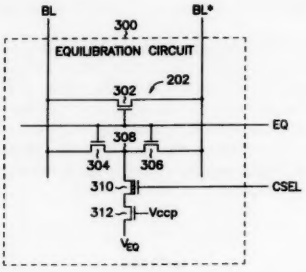
CIRCUIT AND METHOD FOR MEMORY DEVICE WITH DEFECT CURRENT ISOLATION

Stephen L. Casper; David Pinney, and Brent Keeth, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of application No. 08/911,667, Aug. 14, 1997, Pat. No. 5,896,334. This application Feb. 26, 1999, Appl. No. 261,607.

Int. Cl.[7] **G11C** *7/00*

U.S. Cl. 365—202 **16 Claims**



1. A memory device comprising:

an array of word lines and complementary bit line pairs;

a number of memory cells that are each addressably coupled to a word line and a bit line of a complementary bit line pair;

a row decoder and a column decoder that are coupled to the array so as to select a memory cell;

a number of sense amplifiers, each coupled to a complementary bit line pair;

an equilibration voltage source; and

wherein each complementary bit line pair includes:

an equilibration circuit that is coupled to the bit lines of the complementary bit line pair,

a depletion mode transistor that couples the equilibration voltage source to the equilibration circuit; and

wherein a gate of the depletion mode transistor is coupled to receive a control signal from the column decoder that selectively applies a negative voltage to the depletion mode transistor to isolate the equilibration voltage source from the equilibration circuit.

6,041,004

SEMICONDUCTOR DEVICE WITH HIGH SPEED WRITE CAPABILITIES

Ryo Haga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 2, 1997, Appl. No. 982,533

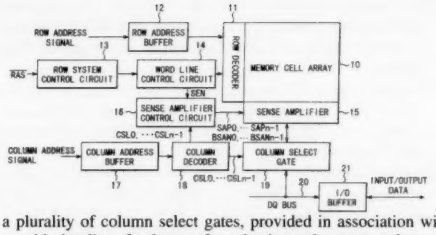
Claims priority, application Japan, Dec. 2, 1996, 8-321738

Int. Cl.[7] **G11C** *7/02*

U.S. Cl. 365—207 **18 Claims**

1. A semiconductor memory device comprising:

a memory cell array including a plurality of memory cells arranged in an array and having a plurality of rows and a plurality of columns;



a plurality of column select gates, provided in association with said plurality of columns, for selecting at least one column of said plurality of columns of said memory cell array;

a column decoder for outputting a column select signal to said plurality of column select gates;

a plurality of sense amplifiers arranged between said memory cell array and said plurality of column select gates and provided in association with said plurality of columns; and

a sense amplifier control circuit for controlling activation of said sense amplifiers independently such that the sense amplifier control circuit activates at least one selected sense amplifier of said plurality of sense amplifiers, which is associated with said at least one column of said plurality of columns selected by said plurality of column select gates, and maintains the unselected sense amplifiers associated with those columns, which are not selected by said plurality of column select gates, in an inactive state.

6,041,005

SEMICONDUCTOR MEMORY DEVICE

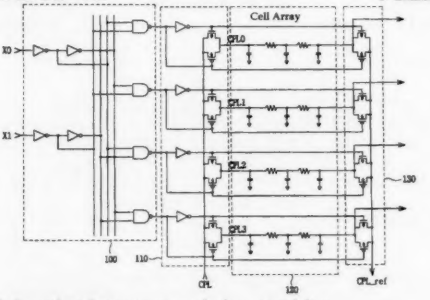
Seung Hyun Yi, Seoul, and Jae Whan Kim, Kyungki-Do, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 29, 1999, Appl. No. 342,105

Claims priority, application Rep. of Korea, Jun. 30, 1998, 98-25993

Int. Cl.[7] **G11C** *13/00*

U.S. Cl. 365—207 **6 Claims**



6. A semiconductor memory device comprising:

(A) a cell plate line driver circuit using a plurality of potentials to stabilize a potential of a cell plate line comprising:

a high voltage application section for applying a high voltage to said cell plate line;

an internal voltage application section for applying an internal voltage to said cell plate line;

a voltage comparison section for comparing a reference cell plate line potential and a potential of an internal voltage and for outputing to said each voltage application section; and

a control section for controlling the operation of said each section; and

(B) a decoder circuit comprising:

a selection section for selectively applying to a cell of which a word line is enabled a cell plate line voltage inputted from said cell plate line driver circuit; and

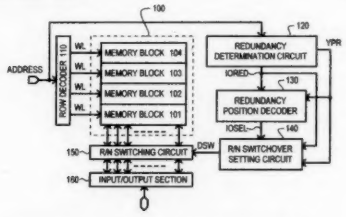
an output section for inputting a reference cell plate line voltage to a voltage comparison section of said cell plate line driver if said cell plate line voltage applied through said selection section is shifted to said reference cell plate line voltage through a cell array.

6,041,006

SEMICONDUCTOR MEMORY DEVICE

Tomohiro Tsuchiya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1999, Appl. No. 261,701
Claims priority, application Japan, Mar. 4, 1998, 10-051933
Int. Cl.[7] G11C *13/00*
U.S. Cl. 365—210 **21 Claims**



1. A semiconductor memory device, comprising:

a plurality of normal cell arrays, each including a plurality of memory cells;

at least one redundancy cell array that includes a plurality of memory cells;

a plurality of memory blocks, each including a plurality of normal cell arrays and at least one redundancy cell array;

a redundancy determination circuit for storing redundancy selection information and defective position information, the redundancy selection information indicating if a normal cell array within a memory block is to be replaced by a redundancy cell array, the defective position information indicating a position of a normal cell array that is to be bypassed by using a redundancy cell array;

a switchover setting circuit having a plurality of setting circuits, each setting circuit having a first switching circuit disposed between a first terminal and an associated second terminal, the first terminal of selected setting circuits being coupled to the second terminal of an adjacent setting circuit, at least one of the first terminals being a lowest terminal that is coupled to a second logic level, and at least one of the second terminals being a highest terminal that is coupled to a redundancy selection information output terminal, the first switching circuit forming a conducting path or a non-conducting path between their first terminals and their associated second terminals in response to defective position information, the second terminals of the setting circuits providing switching signals; and

a switching circuit for selecting one of at least two bit lines according to the switching signals output from the of the switchover setting circuit and connecting the selected bit line to an input/output section.

6,041,007

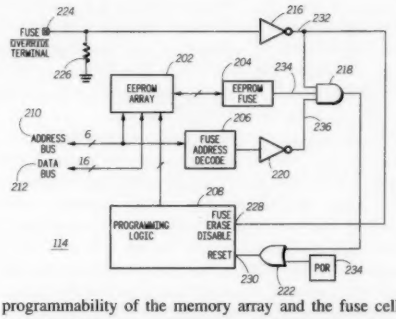
DEVICE WITH PROGRAMMABLE MEMORY AND METHOD OF PROGRAMMING

William Roeckner, Carpentersville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 2, 1998, Appl. No. 17,393
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—225.7 **23 Claims**

1. A device comprising:

a semiconductor die having a memory array with a fuse cell having an output terminal providing a fuse signal indicative of



programmability of the memory array and the fuse cell, the fuse signal having a programming-enable logical state and a programming-disable logical state;

a fuse override terminal for receiving a fuse override signal; and

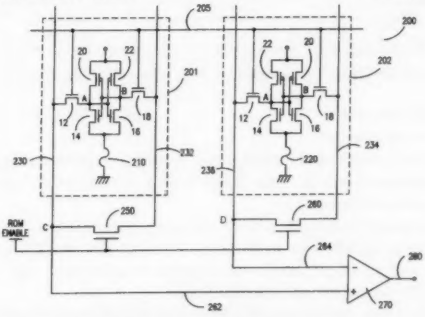
programming logic operatively coupled to the memory array for enabling and disabling programming of the memory array and the fuse cell, wherein when the output terminal of the fuse cell provides the programming-enable logical state the programming logic enables erasing and writing data to the memory array and the fuse cell, when the output terminal of the fuse cell provides the programming-disable logical state the programming logic disables erasing and writing data to the memory array and the fuse cell, and when the output terminal of the fuse cell provides the programming-disable logical state, and the fuse override signal is applied to the fuse override terminal, the programming logic enables erasing and writing data to the memory array and the fuse cell.

6,041,008

METHOD AND APPARATUS FOR EMBEDDED READ ONLY MEMORY IN STATIC RANDOM ACCESS MEMORY

Kenneth W. Marr, Boise, Id., assignor to Micron Technology Inc., Boise, Id.

Filed May 13, 1998, Appl. No. 76,730
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—225.7 **65 Claims**



24. A semiconductor memory device comprising:

a plurality of SRAM cells, each of said SRAM cells located in a memory array comprising a plurality of memory cells, each of said plurality of SRAM cells having a ground connection and a pair of bit lines associated with it, said pair of bit lines of a first cell of said plurality of SRAM cells being connected together, said pair of bit lines of a second cell of said plurality of SRAM cells being connected together;

a plurality of sense amplifiers, each having a first and second input and an output, said first input of one of said plurality of sense amplifiers being connected to said connected pair of bit lines of said first cell, said second input of said one of said plurality of sense amplifiers being connected to said connected pair of bit lines of said second cell,

whereby opening or maintaining said ground connection of said first cell and said second cell produces a signal on said connected bit lines to be read by said sense amplifier, said maintaining of said ground connection causing a different signal at said connection of said pair of bit lines than said opening of said ground connection, and said sense amplifier outputs a signal representative of a stored logic state associated with said opened or maintained ground connections of said first cell and said second cell;

whereby said first cell and said second cell are programmed to function as a ROM cell and permanently store a logic signal.

6,041,009

APPARATUS FOR STABILIZING AN ANTIFUSE USED FOR A MEMORY DEVICE

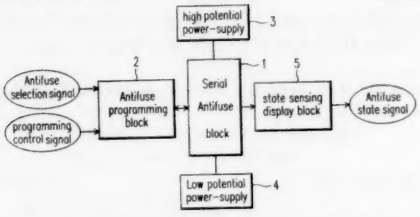
Jung Pill Kim, and In Chul Jung, both of Ichon, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Dec. 7, 1998, Appl. No. 206,318

Claims priority, application Rep. of Korea, Dec. 29, 1997, 97-77394

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—225.7 **6 Claims**



1. An antifuse stabilizing apparatus for a memory device including a peripheral circuit, the antifuse stabilizing apparatus, comprising:

a first terminal;

a second terminal;

a serial antifuse block which has a plurality of antifuses being interconnected in series between the first terminal and the second terminal;

an antifuse programming block for applying a program voltage to an electrode of a selected antifuse of said plurality of antifuses of the serial antifuse block in accordance with a plurality of antifuse selection signals;

a switching means controlled by a programming control signal and for applying selectively a high level voltage to the first terminal; and

a detecting means for outputting an antifuse state signal detecting whether or not the selected antifuse is programmed,

wherein a low level voltage is applied to the second terminal; and

wherein the antifuse programming block is controlled by an inverted signal of the programming control signal.

6,041,010

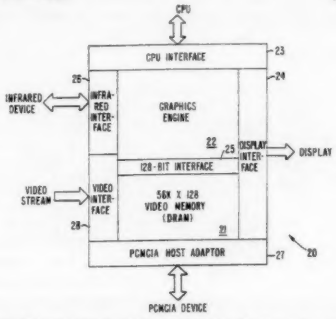
GRAPHICS CONTROLLER INTEGRATED CIRCUIT WITHOUT MEMORY INTERFACE PINS AND ASSOCIATED POWER DISSIPATION

Deepraj S. Puar, Sunnyvale, and Ravi Ranganathan, Cupertino, both of Calif., assignors to NeoMagic Corporation, Santa Clara, Calif.

Continuation of application No. 08/581,086, Dec. 29, 1995, abandoned, which is a division of application No. 08/262,412, Jun. 20, 1994, abandoned. This application Jun. 26, 1997, Appl. No. 883,538.

Int. Cl.[7] G11C *13/00*

U.S. Cl. 365—226 **47 Claims**



1. A graphics controller integrated circuit for connection to a CPU and a display, said graphics controller integrated circuit formed on a substrate and comprising

a video memory holding video data;

a data interface connected to said video memory, said data interface wider than 64 bits; and

a graphics engine connected to said data interface and including a BITBLT operation unit performing operations upon said video data up to a predetermined number of bits at a time, said predetermined number being less than the number of bits of said data interface, responsive to instructions from said CPU, said graphics engine having a substrate layout unconstrained by physical dimensions of a substrate layout of said video memory.

6,041,011

BOOSTER CIRCUIT AND SEMICONDUCTOR MEMORY DEVICE HAVING THE SAME

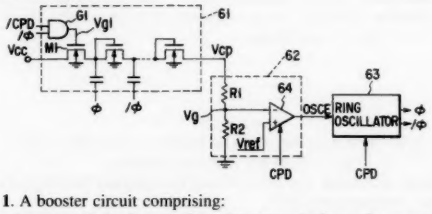
Akira Umezawa; Shigeru Atsumi, both of Yokohama, and Hironori Banba, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1998, Appl. No. 28,221

Claims priority, application Japan, Feb. 26, 1997, 9-042244

Int. Cl.[7] G11C *7/00*

U.S. Cl. 365—226 **37 Claims**



1. A booster circuit comprising:

a booster unit having a voltage input terminal, a voltage output terminal, and a signal input terminal connected to said voltage input terminal; and

a MOS transistor having a current path having a first terminal supplied with a power supply voltage and a second terminal connected to the voltage input terminal of the booster unit,

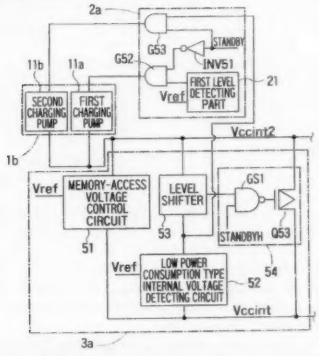
and having a gate supplied with an inverted signal of a signal supplied to the signal input terminal of the booster unit.

6,041,012

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A BOOSTER CIRCUIT AND A STORAGE DEVICE

Hironori Banba, Kamakura; Hitoshi Shiga, Yokohama; Shigeru Atsumi, Yokohama, and Akira Umezawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1998, Appl. No. 31,686
Claims priority, application Japan, Feb. 27, 1997, 9-044344
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—226 **51 Claims**



1. A semiconductor integrated circuit device comprising:

a booster circuit for raising a voltage supplied from an outside;

a semiconductor circuit driven by a voltage depending on a stepped-up voltage raised by said booster circuit;

a first level detecting circuit for detecting fluctuation in said stepped-up voltage during a first operation state of said semiconductor circuit; and

a second level detecting circuit for detecting fluctuation in said stepped-up voltage during a second operation state of said semiconductor circuit, said second level detecting circuit being formed by a circuit having a lower power consumption than that of said first level detecting circuit,

wherein said first level detecting circuit and said second level detecting circuit are powered by a power supply voltage having a same voltage level.

6,041,013

SEMICONDUCTOR MEMORY DEVICE, METHOD OF LAYING OUT SEMICONDUCTOR MEMORY DEVICE, METHOD OF DRIVING SEMICONDUCTOR MEMORY DEVICE AND METHOD OF FORMING PATTERN OF SEMICONDUCTOR DEVICE

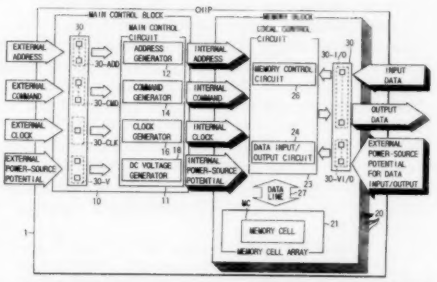
Fumihiro Kohno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of application No. 08/904,955, Aug. 1, 1997, Pat. No. 5,943,285. This application Apr. 13, 1999, Appl. No. 289,964.
Claims priority, application Japan, Aug. 5, 1996, 8-206206
Int. Cl.[7] G11C *8/00*
U.S. Cl. 365—230.03 **10 Claims**

1. A semiconductor memory device comprising:

a main control block having an address signal terminal, a clock signal terminal, a command signal terminal and a power supply terminal as external terminals and including an address signal generating section for receiving an external address signal fed to the address signal terminal to generate an internal address signals, a command signal generating section for receiving an external command signal fed to the command signal terminal to generate an internal command signal, a clock signal generating section for receiving an external clock signal fed to the clock signal terminal to generate an internal clock signal and an internal power supply generating section for receiving an external supply potential fed to the power supply terminal to generate an internal supply potential; and

at least one memory block, each memory block having a data input/output terminal and a power supply terminal for data input/output, a plurality of memory cells for storing data, a data input/output section for sending data to and receiving data from the data input/output terminal in response to the internal command signal and in synchronism with the internal clock signal, the data input/output section being driven by the source power for data input/output fed to the power supply terminal for data input/output, and a memory control section for writing data in a specific one of the plurality of memory cells and reading data from a specific one of the plurality of memory cells in response to the internal address signal and in synchronism with the internal clock signal, the memory control section being driven by the internal power supply potential.

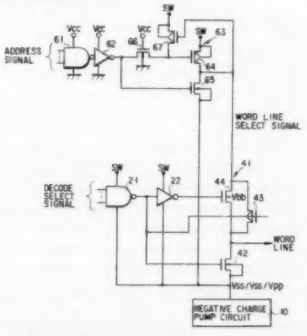


6,041,014

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING ROW DECODER

Shigeru Atsumi, and Sumio Tanaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of application No. 09/006,155, Jan. 13, 1998, which is a continuation of application No. 08/805,612, Feb. 26, 1997, Pat. No. 5,812,459, which is a continuation of application No. 08/603,273, Feb. 20, 1996, Pat. No. 5,680,349, which is a continuation of application No. 08/358,714, Dec. 19, 1994, Pat. No. 5,513,146, which is a division of application No. 07/918,027, Jul. 24, 1992, Pat. No. 5,392,253. This application May 10, 1999, Appl. No. 307,709.
Claims priority, application Japan, Jul. 25, 1991, 3-186439
Int. Cl.[7] G11C *7/00*
U.S. Cl. 365—230.06 **7 Claims**



1. A nonvolatile semiconductor memory device comprising:

a nonvolatile memory cell;

a word line connected to said nonvolatile memory cell;

a decoder to which an address signal is input;

a word line driver having a first node, a second node, an output node, a first P-channel transistor and a first N-channel transistor, a first terminal of said first P-channel transistor being connected to said first node, a second terminal of said first P-channel transistor being connected to said output node, a substrate terminal of said first P-channel transistor being connected to said first node, a substrate terminal of said first N-channel transistor being connected to said second node, and said output node supplying a first predetermined potential to said word line;

a second N-channel transistor having a gate terminal to which a second predetermined potential is applied, a first terminal of said second N-channel transistor being connected to said decoder and a second terminal of said second N-channel transistor being connected to a gate terminal of said first P-channel transistor; and

a second P-channel transistor having a gate terminal connected to which a predetermined signal is applied, a first terminal of said second P-channel transistor being connected to a gate terminal of said first P channel transistor, a second terminal of said second P-channel transistor being connected to a substrate terminal of said second P-channel transistor,

wherein in an erase mode a negative potential is applied to said second node of said word line driver, and a voltage greater than the negative potential is applied to both said first node of said word line driver and the second terminal of said second P-channel transistor.

6,041,015

SEMICONDUCTOR TYPE MEMORY DEVICE HAVING CONSECUTIVE ACCESS TO ARBITRARY MEMORY ADDRESS

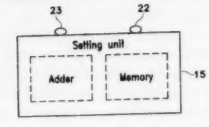
Yasuo Miyamoto, Tenri, and Hidekazu Takata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

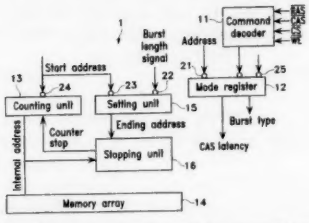
Filed May 5, 1998, Appl. No. 73,228

Claims priority, application Japan, May 14, 1997, 9-124523

Int. Cl.[7] G11C *8/00*

U.S. Cl. 365—236 **8 Claims**





1. A semiconductor type memory device, comprising:

a counting unit for receiving a start address and counting an address taking the start address as a starting point;

a setting unit for receiving the start address and an arbitrary number that is input from an outside of the semiconductor type memory device and generating an ending address based on the start address and the arbitrary number; and

a stopping unit for receiving the counted address and the ending address and causing the counting unit to stop counting when the counted address reaches the ending address;

wherein the setting unit includes a first input terminal for receiving the start address and a second input terminal for receiving the arbitrary number; and the setting unit can receive the start address and the arbitrary number substantially at the same time.

6,041,016

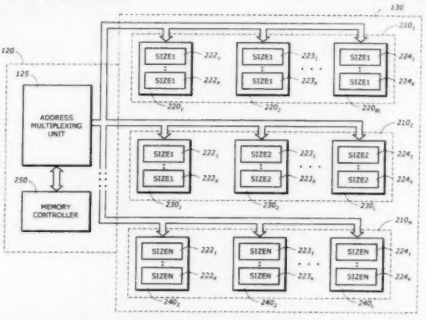
OPTIMIZING PAGE SIZE IN MIXED MEMORY ARRAY USING ADDRESS MULTIPLEXING

David E. Freker, Sacramento, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 4, 1998, Appl. No. 205,509

Int. Cl.[7] G11C *8/00*

U.S. Cl. 365—238.5 **15 Claims**



1. A method for addressing a memory array having N rows of memory devices with different page sizes, the method comprising:

generating a memory address corresponding to one of the N rows of memory devices; and

selecting a device bank address corresponding to a device size and a device page size of the one of the N rows of memory devices.

6,041,017

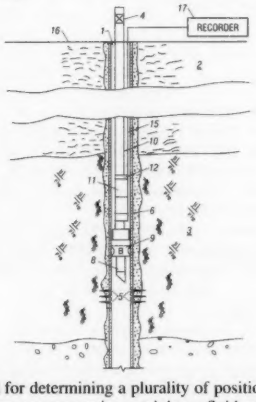
METHOD FOR PRODUCING IMAGES OF RESERVOIR BOUNDARIES

Fred L. Goldsberry, 3222 Candleknoll, Spring, Tex. 77388, assignor to Fred L. Goldsberry, Spring, Tex.

Provisional application No. 60/023,207, Aug. 5, 1996. This application Aug. 5, 1997, Appl. No. 906,671.

Int. Cl.[7] G01V *1/36*

U.S. Cl. 367—38 **26 Claims**



1. A method for determining a plurality of positions of a boundary of a subterranean reservoir containing a fluid under a pressure, comprising:

(a) obtaining over a time interval a pressure of the fluid in a well penetrating the reservoir;

(b) determining a slope of the pressure of the fluid as a function of time;

(c) detecting a plurality of times "t_i" corresponding to an abrupt change in the slope of the pressure as a function of time; and

(d) determining a plurality of ranges "d_i" of influence of the well as a function of the abrupt change.

6,041,018

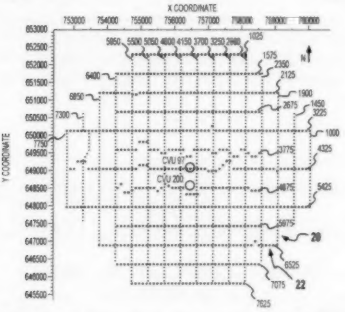
METHOD FOR CORRECTING AMPLITUDE AND PHASE DIFFERENCES BETWEEN TIME-LAPSE SEISMIC SURVEYS

Steven L. Roche, Sugarland, Tex., assignor to Colorado School of Mines, Golden, Colo.

Provisional application No. 60/065,222, Nov. 13, 1997. This application Nov. 13, 1998, Appl. No. 191,567.

Int. Cl.[7] G01V *1/28*

U.S. Cl. 367—46 **12 Claims**



1. A method for processing: (I) a first seismic image of a sub-surface volume of interest that has a first trace and was produced at a first time, and (ii) a second seismic image of substantially the same sub-surface volume that has a second trace and was produced at a second time that followed said first time by a span of time during which there was likely to be a change in the sub-surface volume of interest, to produce a time-lapse image of the sub-surface volume of interest with reduced noise, the first and second traces forming a common trace pair, the method comprising:

cross-correlating the common trace pair to produce a correlation wavelet;

processing said correlation wavelet to identify differences between the first seismic image and the second seismic image;

decomposing said differences into a plurality of composite differences; and

using at least one of said plurality of composite differences to reduce noise in a time lapse image.

6,041,019

FUSING CONTACT DATA FOR BEST-ESTIMATE SOLUTION

Neil A. Jackson, North Kingstown, R.I.; John T. Williamson, Kailua, Hi.; Francis J. Frantz, Fairfax, Va.; Patrick B. Ryll, Portsmouth, R.I., and Hyman A. Greenbaum, Westwood, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

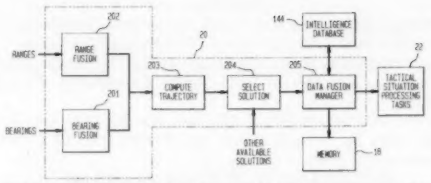
Filed Jul. 7, 1997, Appl. No. 896,527

Int. Cl.[7] G01S *3/80;15/00*

U.S. Cl. 367—124 **6 Claims**

1. A method of determining a best-estimate solution to a moving contact using a plurality of trackers, said method comprising the steps of:

providing bearing-to-contact data and range-to-contact data from each of said plurality of trackers;



applying an averaging function to said bearing-to-contact data to determine weighted-average bearing data and an associated standard deviation for each tracker of said plurality of trackers;

applying said averaging function to said range-to-contact data to determine weighted-average range data;

generating a computed solution to said moving contact using said weighted average bearing data from a best tracker and said weighted-average range data, said best tracker being the tracker having the lowest said associated standard deviation and wherein said computed solution includes heading and speed of said moving contact;

providing a plurality of independently generated solutions to said moving contact; and

determining a root mean square (RMS) error in terms of bearing for each of said computed solution and said plurality of independently generated solutions, wherein one of said computed solution and said plurality of independently generated solutions producing the lowest said RMS error is said best-estimate solution.

6,041,020

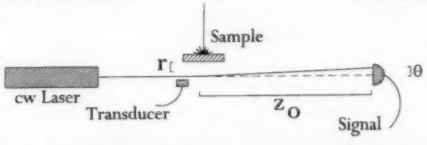
GAS-COUPLED LASER ACOUSTIC DETECTION

James N. Caron; James B. Mehl, and Karl V. Steiner, all of Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Apr. 21, 1997, Appl. No. 840,968

Int. Cl.[7] H04R *14/00*

U.S. Cl. 367—149 **13 Claims**



1. A non-contacting method of detecting and measuring ultrasonic waves in solid materials comprising the following steps:

a) generating an ultrasonic wave in a solid material that is in contact with a gas so as to cause said solid material to generate an acoustic field in said gas;

b) passing a light beam through said gas and said acoustic field and in a direction which will cause said light beam to hit one or more sensors after said light beam has passed through said gas and said acoustic field without said light beam hitting any surface of said solid material, said acoustic field causing a deflection of said light beam as said light beam passes through said gas and said acoustic field; and

c) measuring the deflection of said light beam with said one or more sensors.

6,041,021

ELECTRONICALLY CONTROLLED MECHANICAL TIMEPIECE AND CONTROL METHOD THEREFOR

Osamu Shinkawa, Suwa, and Kunio Koike, Matsumoto, both of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

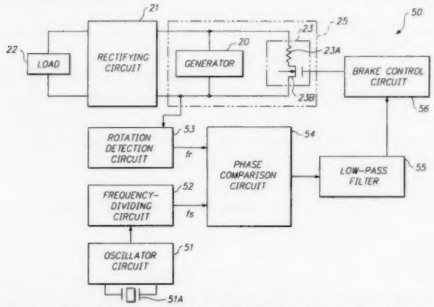
PCT No. PCT/JP98/04395, § 371 Date Jun. 24, 1999, § 102(e) Date Jun. 24, 1999, PCT Pub. No. WO99/17172, PCT Pub. Date Apr. 8, 1999

PCT Filed Sep. 30, 1998, Appl. No. 319,048

Claims priority, application Japan, Sep. 30, 1997, 9-265204

Int. Cl.[7] G04B *1/00;* **G04C** *3/00*

U.S. Cl. 368—64 **8 Claims**



1. An electronically controlled mechanical timepiece comprising:

a mechanical energy source;

a wheel train bridge;

a generator driven by said mechanical energy source and connected to said mechanical energy source by said wheel train bridge, said generator generating induced electric power for supplying electric energy;

a brake circuit that brakes said generator in response to a braking control signal;

pointers connected to said wheel train bridge;

and a rotation control circuit that controls said brake circuit to control the rotation cycle of said generator;

wherein said rotation control circuit comprises:

a rotation detection circuit that generates a rotation signal of said generator;

a target-signal generating circuit that generates a target signal corresponding to a target number of revolutions;

a phase-difference compensating circuit that detects a phase difference between said rotation signal output from said rotation detection circuit, and said target signal output from said target-signal generating circuit, and outputs a phase-difference compensation signal that is input to said brake circuit as said braking control signal.

6,041,022

MECHANICAL-ELECTRIC ENERGY CONVERTER AND WATCH PART COMPRISING THIS ENERGY CONVERTER

Mai Xuan Tu, Ecublens; Michel Schwab, Bienne, and Jean-Pierre Musy, Begnins, all of Switzerland, assignors to Patek Philippe S.A., Plan-Les-Ouates, Switzerland

PCT No. PCT/IB97/01569, § 371 Date Jun. 15, 1999, § 102(e) Date Jun. 15, 1999, PCT Pub. No. WO98/27473, PCT Pub. Date Jun. 25, 1998

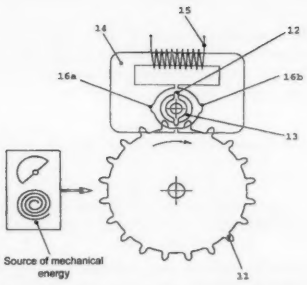
PCT Filed Dec. 16, 1997, Appl. No. 319,988

Claims priority, application Switzerland, Dec. 18, 1996, 3100/96

Int. Cl.[7] G04B *1/00;* **G04L** *3/00*

U.S. Cl. 368—64 **13 Claims**

1. Mechanical-electrical energy converter comprising mechanical energy transmission means, comprised by at least one toothed wheel, means for transforming mechanical energy into electrical



energy, comprised by at least one electromagnetic generator having at least one rotor driven by said mechanical energy transmission means, characterized by the fact that each rotor of each electromagnetic generator has a positioning couple which determines its rest equilibrium position in the absence of external couples, by the fact that the drive of the rotor or rotors by the mechanical energy transmission means is active only over a limited angle $\alpha 0$ of the rotor, such that the rotor or rotors cannot turn by a complete revolution, but oscillate about their rest equilibrium position.

6,041,023

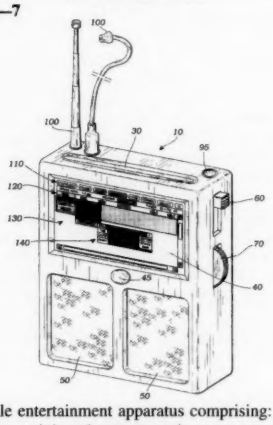
PORTABLE DIGITAL RADIO AND COMPACT DISK PLAYER

Cynthia Lakhansingh, 401 W. 47th St., Apt 12, New York, N.Y. 10036

Filed Mar. 29, 1999, Appl. No. 280,238

Int. Cl.[7] H04H *9/00*

U.S. Cl. 369—7 **7 Claims**



1. A portable entertainment apparatus comprising:

a means for receiving electromagnetic wave energy signals and for converting said signals into digital data signals;

a means for reading a compact disk;

a touch sense screen means for video information display and selection using menu graphics;

a means for producing an audio output;

a read and write means for digital data storage using a compact disk;

a data processing program, the data processing program stored in the digital data storage means;

a means for processing signals in accordance with the data processing program;

the energy signals receiving means, compact disk reading and writing means, touch sense means, audio output means, and data storage means interconnected with an electronic circuit enabled for receiving, storing, organizing and outputting audio and video information in accordance with manual selec-

tions through the touch sense video information display and selection means as guided by the data processing program;

a touch sense keyboard is enabled by the monitor for manual input of titles under which recorded material may be saved; and

a search capability is enabled for searching on single or multiple words or parts of words to retrieve said digital data without the necessity for recalling exact titles.

6,041,024

SIGNAL REPRODUCING APPARATUS UTILIZING DISPLACEMENT OF MAGNETIC WALL

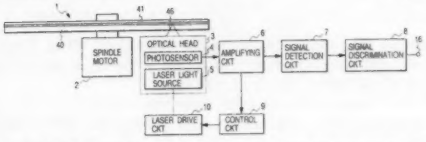
Kazuyoshi Ishii, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1997, Appl. No. 931,363

Claims priority, application Japan, Sep. 18, 1996, 8-246258

Int. Cl.[7] G11B *11/00*

U.S. Cl. 369—13 **12 Claims**



1. A signal reproducing apparatus for reproducing a micro mark by causing a magnetic wall to be displaced on a magnetic recording medium, said apparatus comprising:

heating means which applies a partial temperature distribution onto the medium and is adapted to move relative to the medium;

reproducing means which detects a magnetization direction on the medium and is adapted to move relative to the medium; and

means for controlling said heating means so as to form such a temperature distribution as to separate, with respect to time, an occurrence of a first magnetic wall displacement from the front side of a temperature peak position in the temperature distribution toward the temperature peak position and an occurrence of a second magnetic wall displacement from the backside of the temperature peak position toward the temperature peak position.

6,041,025

DATA DISK INCLUDING SUPPLEMENTARY INFORMATION ENABLING RETRIEVAL OF RELATED INFORMATION FROM ANOTHER STORAGE MEDIUM

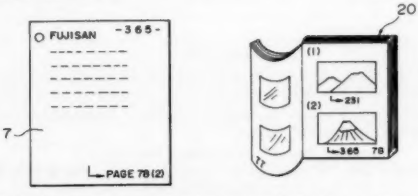
Norio Ohga, and Yoshitaka Ukita, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 08/691,334, Aug. 2, 1996, Pat. No. 5,930,208. This application Aug. 6, 1997, Appl. No. 906,702.

Claims priority, application Japan, Aug. 9, 1995, 7-222753

Int. Cl.[7] G09B *3/00*

U.S. Cl. 369—30 **5 Claims**



1. An information reproduction system including an electronic storage medium and at least one paper storage medium, the information reproduction system including:

article data including character information and supplementary information recorded on the electronic storage medium, the supplementary information representing the location at which information related to said article data is recorded in the paper storage medium; and

index information for retrieving said article data.

6,041,026

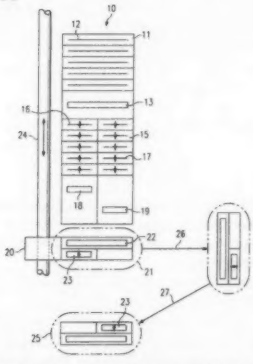
STORAGE AND RETRIEVAL LIBRARY WITH SIDE-BY-SIDE STORAGE CELLS

Jerry Walter Hammar; John Edward Kulakowski; Rodney Jerome Means, and Chi-Hung Dang, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/852,302, May 7, 1997, Pat. No. 5,933,396. This application Feb. 25, 1999, Appl. No. 257,056.

Int. Cl.[7] G11B *17/22;15/68*

U.S. Cl. 369—36 **4 Claims**



1. A method for storing and retrieving multi-sized media, comprising large sized media and small sized media, in at least one column of storage cells, comprising full width storage cells and side-by-side storage cells, and by a media picker having a first gripper for accessing large sized media and a second gripper for accessing small sized media, and positionable in one orientation and in an opposed orientation, comprising the steps of:

storing said small sized media in one side of said column of side-by-side storage cells in a first orientation, said storage cells of said one side of said column having one type of address;

storing said small sized media in the other side of said column of side-by-side storage cells in a second orientation, said storage cells of said other side of said column having another type of address;

storing said large sized media in said full width storage cells, said full width storage cells having a third type of address;

determining that an address of a storage cell to be accessed is said third type of address, operating said media picker to position said first gripper for accessing said large sized media in said full width storage cells;

determining that an address of a storage cell to be accessed is said one type of address, operating said media picker to position said second gripper in said one orientation for accessing said small sized media in said one side of said column of side-by-side storage cells in said first orientation; and

determining that an address of a storage cell to be accessed is said another type of address, operating said media picker to position said second gripper in said opposed orientation for accessing said small sized media in said other side of said column of side-by-side storage cells in said second orientation.

6,041,027

OPTICAL PICKUP FOR USING DISKS EACH HAVING A DIFFERENT THICKNESS

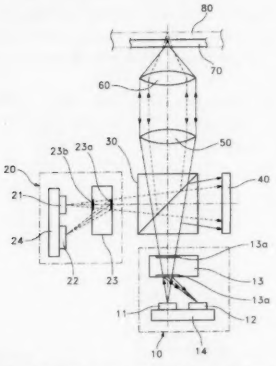
Jin-hwan Kim, and Min-ho Jang, both of Kyonggi-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Sep. 16, 1997, Appl. No. 931,288

Claims priority, application Rep. of Korea, Sep. 16, 1996, 96-40179

Int. Cl.[7] **G11B** *7/00;* **G02B** *5/32*

U.S. Cl. 369—44.24 **10 Claims**



1. An optical pickup for use with disks each having a different thickness, comprising:

first and second optical modules, said first and second optical modules comprising:

first and second light sources, respectively, for generating light each having a different wavelength;

first and second detecting means, respectively, for each receiving reflected light from said disks which each have a different thickness, said first and second detecting means for detecting electrical signals;

an objective lens for collecting light radiated from said first and second light sources and focusing said light on said disks each having a different thickness;

optical path control means for controlling an optical path so that the light radiated from said first and second light sources can be incident on said objective lens; and

means for adjusting a radiation angle of said first and second light sources using said first and second optical modules to restrict the effective numerical aperture of said objective lens.

6,041,028

DYNAMIC ADJUSTMENT OF DISK-DRIVE PICKUP SIGNALS

Thomas A. Quan, Mt. View, and John L. Grimsley, Los Altos, both of Calif., assignors to Oak Technology, Inc., Sunnyvale, Calif.

Provisional application No. 60/043,495, Apr. 11, 1997. This application Aug. 22, 1997, Appl. No. 917,582.

Int. Cl.[7] **G11B** *7/00*

U.S. Cl. 369—44.34 **20 Claims**

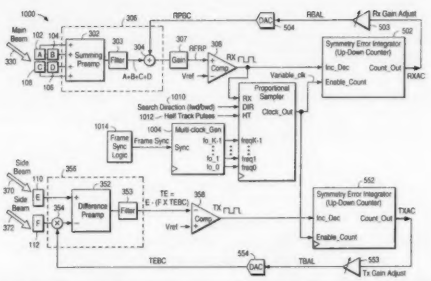
1. A circuit comprising:

a summing junction that receives a first signal;

a comparator for generating a second signal having a variable period based upon said first signal;

a first up-down counter whose count direction is controlled by said second signal, said first up-down counter generating a correction bias signal;

a proportional sampler providing a variable sampling strobe to said first up-down counter, said sampling strobe operable to adjust frequency of count operation in said first up-down counter based upon achieving a desired number of counts within approximately said variable period; and



a feedback loop for returning said correction bias signal to said summing junction.

6,041,029

DISC APPARATUS

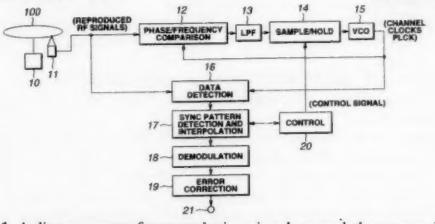
Michihiko Iida; Tetsuji Kawashima; Shoji Sato, all of Kanagawa, and Shozo Masuda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 26, 1998, Appl. No. 32,500

Claims priority, application Japan, Feb. 28, 1997, P09-046671

Int. Cl.[7] **G11B** *7/00*

U.S. Cl. 369—50 **10 Claims**



1. A disc apparatus for reproducing signals recorded on a rewritable disc-shaped recording medium, comprising:

signal read-out means for reading out signals recorded on the disc-shaped recording medium;

clock signal generating means for generating clock signals based on a comparison error signal between the read-out signal and the generated clock signals;

synchronization signal detection means for detecting synchronization signals from the read-out signal;

control means for predicting the timing a signal read-out position of the signal read-out means reaches a low-reliability area at a specified position of the disc-shaped recording medium based on a recording format and for generating control signals directly before the predicted timing; and

clock signal holding means for holding the comparison error signal entering said clock signal generating means based on said control signals.

6,041,030

OPTICAL DISK RECORDING/REPRODUCING DEVICE WITH ECCENTRIC AND INCLINE CHUCK CONTROL

Takao Ohmi, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

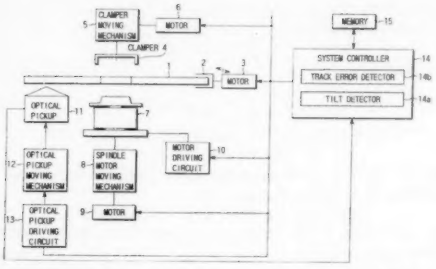
Filed Sep. 17, 1997, Appl. No. 932,123

Claims priority, application Japan, Sep. 18, 1996, 8-246429

Int. Cl.[7] **G11B** *7/00*

U.S. Cl. 369—54 **19 Claims**

1. An optical disk device which records information on or reproduces recording information from an optical disk by use of optical head while the optical disk is chucked on a disk rotating mechanism and rotated, said optical disk device comprising:



detecting means for detecting a tilt angle of the optical disk as it rotates;

determining means for determining whether the tilt angle detected by said detecting means is set within a permissible range; and

control means for re-executing the chucking operation on the optical disk when said determining means determines that the tilt angle exceeds the permissible range,

wherein, upon determining that the tilt angle exceeds the permissible range, said control means causes the optical disk to be released from the disk rotating mechanism, adjusts the disk rotating mechanism, and causes the optical disk to be re-chucked.

6,041,031

OPTICAL DISC RECORDING/REPRODUCTION APPARATUS AND METHOD

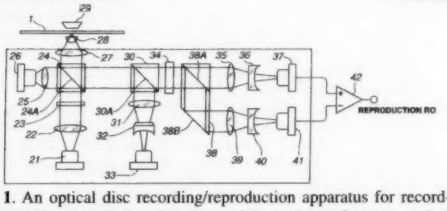
Isao Ichimura, Kanagawa; Fumisada Maeda; Kenji Yamamoto, both of Tokyo; Kiyoshi Ohsato, Chiba; Toshio Watanabe, and Akira Suzuki, both of Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Filed Dec. 19, 1997, Appl. No. 994,455

Claims priority, application Japan, Dec. 20, 1996, P08-340904

Int. Cl.[7] G11B *7/00*

U.S. Cl. 369—112 **11 Claims**



1. An optical disc recording/reproduction apparatus for recording and/or reproducing data by applying a beam from an optical head unit through a substrate of an optical disc onto/from a recording layer of the optical disc, wherein said substrate of said optical disc has a thickness of 0.3 mm or below, and said optical head unit comprises:

an objective lens for converging an incident beam and emitting the beam toward said optical disc;

a forward lens for converging the beam introduced through said objective lens and applying the beam to said optical disc;

a lens holder in which said objective lens and said forward lens are fixed; and

an actuator for driving said objective lens and said forward lens as a unitary block and controlling at least focusing,

said objective lens and said forward lens having (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of ±80 μm, (3) a distance between the objective lens and the forward lens of 25 μm or less, and (4) inclination angles less than 0.4°.

6,041,032

DISK CHANGER WITH TRAYS MOVABLE BETWEEN RETAINING AND DRAWN-OUT POSITIONS

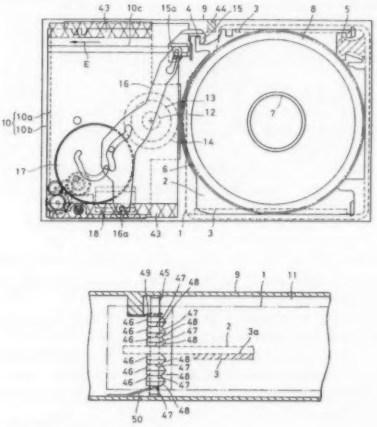
Nobuo Ishida; Jun Togashi; Tomomichi Kimura; Kiyoshi Morikawa; Yoshihumi Nakayama; Hiroshi Akiyama; Tatsuya Yanagisawa, and Takashi Ota, all of Kawagoe, Japan, assignors to Pioneer Electronic Corp., Japan

Filed Jun. 18, 1997, Appl. No. 877,805

Claims priority, application Japan, Jun. 19, 1996, 8-178549

Int. Cl.[7] G11B *17/26*

U.S. Cl. 369—191 **22 Claims**



1. A disk changer comprising:

a disk retaining means for retaining a plurality of trays in respective retaining positions, on each of which trays a disk can be loaded, in a manner that said trays can be drawn out from their respective retaining positions;

a guiding means which is disposed to correspond to said retaining positions, for guiding said trays in a process of drawing out said trays or a process of putting back said trays;

a tray moving means for drawing out a tray selected from said plurality of trays retained in said retaining means and for putting back said selected tray to said retaining position; and

a driving means for driving a disk moved by said selected tray drawn out by said tray moving means;

wherein said guiding means elastically holds said selected tray when said selected tray is being drawn out by said tray moving means and after said selected tray has been drawn out, and is operative to prevent other ones of said trays from being drawn out when said selected tray is being drawn out.

6,041,033

DISK HOLDING DEVICE

Kensei Otsubo, Kasuga, and Hideo Yamaguchi, Fukuoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1997, Appl. No. 991,539

Claims priority, application Japan, Dec. 18, 1996, 8-337895; Jul. 4, 1997, 9-179373

Int. Cl.[7] G11B *17/028*

U.S. Cl. 369—271 **41 Claims**

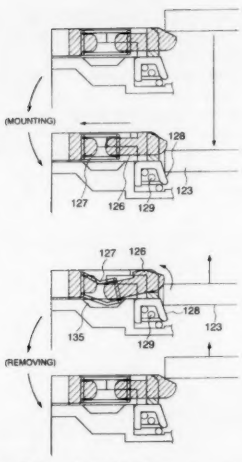
1. A disk holding device for holding a disk by being passed through a center hole portion of the disk, said device comprising:

a plurality of claw-like holding means for engaging with the center hole portion of the disk to hold the disk;

first urging means for urging said claw-like holding means in a radial direction of the disk;

center support means for receiving (i) said claw-like holding means such that said claw-like holding means are slidable in the radial direction of the disk and (ii) said first urging means;

disk alignment means having an alignment slanting portion for engaging with the center hole portion of the disk to align the



center of the disk, said disk alignment means being slidable relative to said center support means in a disk-loading and a disk-unloading direction;

second urging means for urging said disk alignment means in the disk-unloading direction; and

rotary disk means for supporting the disk thereon, wherein:

said disk alignment means and said center support means are arranged coaxially with respect to a rotation shaft of said rotary disk means.

6,041,034

SPREAD SPECTRUM COMMUNICATION SYSTEM

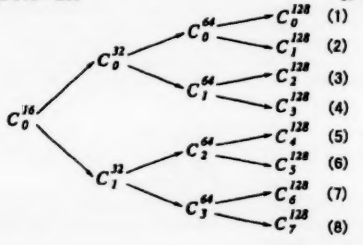
Hidenobu Fukumasa; Yasuyuki Oishi; Kazuo Nagatani, and Hajime Hamada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 30, 1997, Appl. No. 940,479

Claims priority, application Japan, Dec. 20, 1996, 8-342235

Int. Cl.[7] **H04B** *7/216;7/212;1/38*

U.S. Cl. 370—203 **19 Claims**



1. A method for generating code division multiple access data from data having different rates by a direct spread spectrum, said method comprising the steps of:

combining an orthogonal code and a reversed orthogonal code obtained by inverting the orthogonal code, for each of orthogonal code sequence structured by an m-sequence thereby to generate a first sequence of orthogonal codes;

combining two of the orthogonal code for each of orthogonal code sequences structured by the m-sequence thereby to generate a second sequence of orthogonal codes;

combining two of the reversed orthogonal code for each of orthogonal code sequences structured by the m-sequence thereby to generate a third sequence of orthogonal codes; and

generating another orthogonal code having twice a code length of the orthogonal code from the first, second and third sequence of orthogonal codes; and

multiplying the generated orthogonal code and a different m-sequence, together.

6,041,035

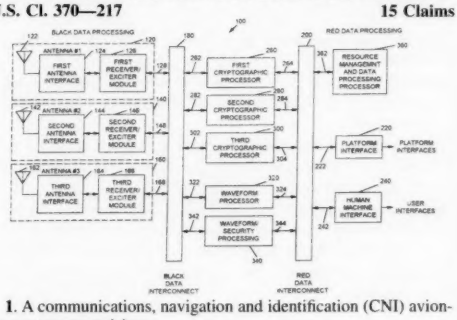
OPEN SYSTEM MODULAR ELECTRONICS ARCHITECTURE

John R. Thedens, Central City, Iowa, assignor to Rockwell Collins, Inc., Cedar Rapids, Iowa

Filed Jun. 30, 1997, Appl. No. 885,482

Int. Cl.[7] **G01R** *31/08;* **G06F** *11/00;* **G08C** *15/00;* **H01H** *67/00*

U.S. Cl. 370—217 **15 Claims**



1. A communications, navigation and identification (CNI) avionics system comprising:

a first integrated sensor performing a first CNI function;

a second integrated sensor performing a second CNI function, wherein the first CNI function has a priority higher than a priority of the second CNI function;

a first interconnect coupled to each of the first integrated sensor and the second integrated sensor, the first interconnect carrying signals to and from the first and second integrated sensors;

a plurality of system assets;

a second interconnect coupled to each of the plurality of system assets, the second interconnect carrying signals to and from the plurality of system assets;

a first communication thread coupling and carrying signals between the first integrated sensor and a corresponding one of the plurality of system assets, wherein the first communication thread includes the first interconnect, a first cryptographic processor and the second interconnect;

a second communication thread coupling and carrying signals between the second integrated sensor and a corresponding one of the plurality of system assets, wherein the second communication thread includes the first interconnect, a second cryptographic processor and the second interconnect; and

means for automatically reassigning the second cryptographic processor to the first communication thread if the first cryptographic processor malfunctions such that the first CNI function having a previously assigned higher priority than the second CNI function is still performed.

6,041,036

DUAL RECEIVE, DUAL TRANSMIT FAULT TOLERANT NETWORK ARRANGEMENT AND PACKET HANDLING METHOD

Young Sik Baek; Sang Man Lee, and Hun Kang, all of Daejoen, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Dec. 12, 1997, Appl. No. 990,047

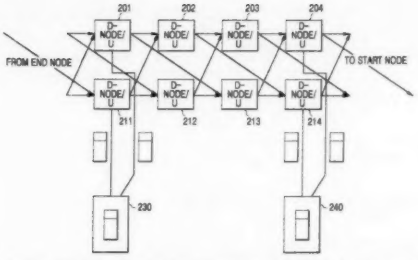
Claims priority, application Rep. of Korea, May 8, 1997, 97-17716

Int. Cl.[7] **H04J** *1/16;3/14;* **H04L** *1/00;12/26*

U.S. Cl. 370—222 **3 Claims**

1. A fault tolerant network arrangement using a dual cross path, for real-time switching, comprising:

multiple nodes constitutes a ring, each of which is composed of a upper-level dual receive/transmit node (D-node/U) and



lower-level dual receive/transmit node (D-node/L), each of the nodes having two input ports and two output ports,

wherein one of the output ports of the nth D-node/U is coupled to one of the input ports of the (n+1)th D-node/U, the other output port of the nth D-node/U is coupled to one of the input ports of the (n+2)th D-node/L, one of the output ports of the nth D-node/L is coupled to one of the input ports of the (n+1)th D-node/L, and the other input port of the nth D-node/L is coupled to the other input port of the (n+1)th D-node/U, each of the nodes receiving two packets, selecting one of them, abandoning the other one, duplicating the selected one, and transmitting the duplicated packets through the two output ports.

6,041,037

ATM VIRTUAL PATH SWITCHING NODE

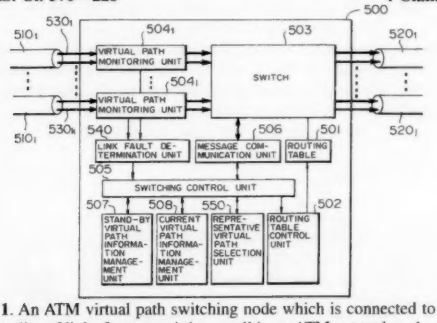
Makoto Nishio, and Hiromitsu Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 18, 1997, Appl. No. 912,739

Claims priority, application Japan, Aug. 19, 1996, 8-217255

Int. Cl.[7] G01R *31/08;* **G06F** *11/00*

U.S. Cl. 370—228 **4 Claims**



1. An ATM virtual path switching node which is connected to a plurality of links for transmitting a cell in an ATM network and can switch a current virtual path set in each of said plurality of links in advance and used to provide a service to a stand-by virtual path set in advance for detour when a fault occurs in said ATM network, comprising:

a switch for switching said current virtual path and said stand-by virtual path;

a routing table which is referred to when said current virtual path and said stand-by virtual path are to be switched by said switch;

a routing table control unit for rewriting said routing table;

a virtual path monitoring unit for monitoring a fault in said current virtual path in units of links;

a link fault determination unit for, upon being notified of a faulty current virtual path by said virtual path monitoring unit, comparing the number of faulty current virtual paths notified in units of links with a predetermined threshold value, said link fault determination unit determining, when the number of faulty current virtual paths is equal to or larger than the threshold value, that a fault has occurred in said link, and determining, when the number of faulty current virtual paths is smaller than the threshold value, that a fault has occurred in said current virtual path notified from said virtual path monitoring unit;

a current virtual path information management unit for managing correspondence between said current virtual path having, as one switching terminal, a self ATM virtual path switching node and said plurality of links in said ATM network;

a stand-by virtual path information management unit for managing correspondence between said current virtual path and said stand-by virtual path;

a message communication unit for transmitting/receiving a fault notification signal representing the fault in said current virtual path, a fault notification signal representing the fault in said link, and a switching control signal for designating switching from said current virtual path to said stand-by virtual path to/from another ATM virtual path switching node via said link; and

a switching control unit connected to said link fault determination unit, said current virtual path information management unit, said stand-by virtual path information management unit, said routing table control unit, and said message communication unit to control switching from said current virtual path to said stand-by virtual path.

6,041,038

PACKET SWITCHING DEVICE AND CELL TRANSFER CONTROL METHOD

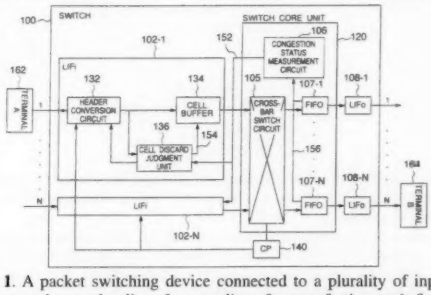
Takeshi Aimoto, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1997, Appl. No. 788,416

Claims priority, application Japan, Jan. 29, 1996, 8-012514

Int. Cl.[7] G01R *31/08*

U.S. Cl. 370—229 **17 Claims**



1. A packet switching device connected to a plurality of input lines and to a plurality of output lines for transferring each fixed length packet, or cell inputted from each input line to any output line determined by cell header information, comprising:

switch means having a plurality of input ports and a plurality of output ports for transferring a cell inputted from each input port to any output port determined by cell header information;

plural input line interfaces, each connected between one of said input ports and an input line;

plural output line interfaces, each connected between one of said output ports and an output line;

a call control unit connected to said switch means and each of said input line interfaces for transmitting and receiving a call control cell, respectively, to and from said switch means, and for transmitting control information including header rewrite information to each of said input interfaces; and

congestion monitor means for detecting a congestion status of output cells on each of said output ports and notifying each of said input line interfaces of a detected congestion status as congestion status information,

wherein said call control unit includes:

means, operative when setting up a connection belonging to a particular traffic class which does not make bandwidth reservation, for notifying said input line interface connected to a connection setup requester terminal of identification information on said connection and control information including traffic class information from a control message

from said calling unit and sub-class information indicating a priority related to cell discarding, and

each of said input line interfaces includes cell discard control means for selectively discarding user cells belonging to said particular traffic class received from each input line after the connection is set up, in conformity with a predetermined discard condition determined by a congestion status at a destination output port of said user cell revealed from said congestion status information and the priority related to cell discard notified from said call control unit.

6,041,039

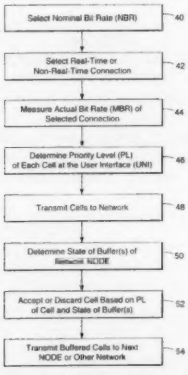
SYSTEM AND METHOD FOR DETERMINING NETWORK BANDWIDTH AVAILABILITY USING PRIORITY LEVEL FEEDBACK

Matti Kalevi Kilkki, Espoo, and Jussi Pekka Olavi Ruutu, Helsinki, both of Finland, assignors to Nokia Telecommunications, OY, Espoo, Finland

Filed Mar. 20, 1997, Appl. No. 821,222

Int. Cl.[7] **G06F** *11/00;* **H04L** *12/56*

U.S. Cl. 370—230 **19 Claims**


Select Nominal Bit Rate (NBR)
40
Select Real-Time or Non-Real-Time Connection
42
Measure Actual Bit Rate (MBR) of Selected Connection
44
Determine Priority Level (PL) of Each Cell at the User Interface (UNI)
46
Transmit Cells to Network
48
Determine State of Buffer(s) of Network NODE
50
Accept or Discard Cell Based on PL of Cell and State of Buffer(s)
52
Transmit Buffered Cells to Next NODE or Other Network
54

1. A method of acquiring load information for a network connection defined between a source unit and a destination unit, comprising:

determining a threshold priority level for each network node defined along the network connection, the threshold priority level being used when accepting or discarding information elements received by each node;

computing a worst-case threshold priority level using the threshold priority levels determined for the nodes;

transmitting a status cell along the network connection:

maintaining a record of the worst-case threshold priority level by storing in the status cell information indicative of the worst-case threshold priority level; and

providing the worst-case threshold priority level to the source unit.

6,041,040

LARGE-SCALE SERVICE-RATE REGULATORS FOR ATM SWITCHING

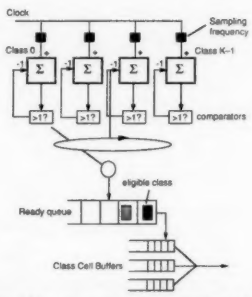
Maged E. Beshai, Stittsville, and Stacy W. Nichols, Kanata, both of Canada, assignors to Nortel Networks Corporation, Montreal, Canada

Filed Apr. 7, 1997, Appl. No. 827,882

Int. Cl.[7] **G01R** *31/08;* **G06F** *11/00;* **H04J** *3/16;3/22*

U.S. Cl. 370—232 **19 Claims**

1. In an ATM network, a method of regulating telecommunications traffic that is classified in two or more classes of connections by service rates in which class cell buffers are sampled for transmission downstream comprising steps of:



counting cyclic time in units of cell transfer period, the cyclic time being expressed in a k-bit word and the counting cycle of length 2^k cell periods being longer than the sampling interval of any class;

initializing class accumulators by sampling intervals for the classes, each sampling interval being expressed as an m-bit word, m being larger than k, the most-significant k bits of 854 m bits representing an integer multiple of a cell period and the remaining (m−k) bits representing a fraction of a cell period;

declaring a class eligible for service when the value of the most-significant k bits of its accumulator equals the cyclic time

adding class' sampling interval to the content of the class accumulator when a class is declared eligible for service; and

performing the above steps in parallel for all classes so that each class may be declared eligible for service independently from other classes.

6,041,041

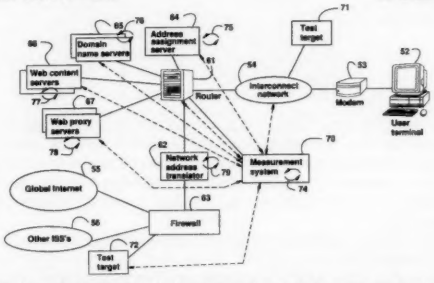
METHOD AND SYSTEM FOR MANAGING DATA SERVICE SYSTEMS

Srinivas Ramanathan, 655 S. Farioaks Ave., Sunnyvale, Calif. 94086; Edward H. Perry, 484 Franklin St., Mountain View, Calif. 94041, and Tai Jin, 1900 Parkwood Dr., San Mateo, Calif. 94403

Filed Apr. 15, 1997, Appl. No. 838,117

Int. Cl.[7] **H04J** *3/14*

U.S. Cl. 370—241 **30 Claims**



1. A method of determining status of a module among a plurality of modules of a data service system, the method comprising:

(A) collecting measurements from at least one measurement route that involves the module;

(B) analyzing interdependencies of the measurements to determine the status of the module, wherein the step (B) further comprises

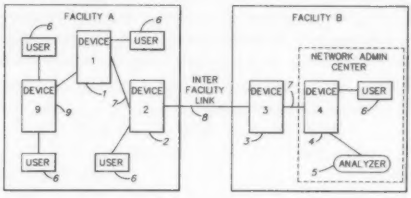
(I) determining the status of the module if only one measurement route involves the module;

(II) if two or more measurement routes involve the module, then correlating the measurements based on their interdependencies.

6,041,042
REMOTE PORT MIRRORING SYSTEM AND METHOD THEREOF

Richard Bussiere, Manchester, N.H., assignor to Cabletron Systems, Inc., Rochester, N.H.

Filed May 27, 1997, Appl. No. 863,806
Int. Cl.[7] H04J *3/14;* **H04L** *12/56*
U.S. Cl. 370—245 **17 Claims**



1. A method of remote monitoring of a device port in a connectionless communications network having a plurality of IEEE 802 compliant devices coupled together, the method comprising steps of:

selecting a first port of a first device to be monitored and from which to mirror MAC frame packets;

selecting a second port of the first device to which to mirror the MAC frame packets;

selecting a first port of a second device remotely located from the first device and connected to said connectionless communications network, said first and second devices being IEEE 802 compliant devices;

selecting a second port of the second device and connecting an analyzer to the second port of the second device;

mirroring the MAC frame packets from the first port of the first device to the second port of the first device;

encapsulating the MAC frame packets of the first port of the first device by appending an IEEE 802 MAC header including an address of the second port of the second device;

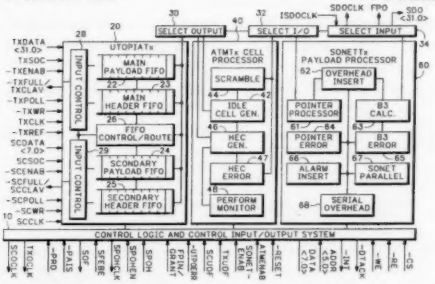
sending the encapsulated MAC frame packets through the connectionless communications network to a remote location of the second device; and

monitoring the first port of the first device by the MAC frame packets received at the second port of the second device by employing said analyzer.

6,041,043
SONET PATH/ATM PHYSICAL LAYER TRANSMIT/RECEIVE PROCESSOR

Claude Denton, Portland; Donald C. Kirkpatrick, and Samuel J. Peters, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Oct. 25, 1996, Appl. No. 736,074
Int. Cl.[7] H04L *12/56*
U.S. Cl. 370—254 **4 Claims**



4. A SONET path/ATM physical layer transmit/receive processor comprising:

an interface having a first side for coupling to a source/destination of data in 32-bit and 8-bit formats and a second side;

an ATM cell processor for processing ATM physical layer data having a first side and a second side;

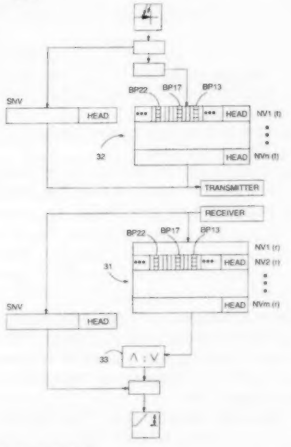
a SONET payload processor for processing SONET frame data having a first side and a second side; and

a plurality of selectors coupled in series so that an output from one is an input to the next one in the series with the first in series also being coupled between the second side of the interface and the first side of the ATM cell processor, the next in series also being coupled between the second side of the ATM cell processor and the first side of the SONET payload processor, and the next again in series also being coupled between the second side of the SONET payload processor and a transmission medium so as to configure a data path between the source/destination and the transmission medium through or around the ATM cell processor and/or the SONET payload processor according to input commands.

6,041,044
CONTROL NETWORK AND CONFIGURATION METHOD THEREFOR

Jörg O. Seiffert, Aidlingen, Germany, and Daniel F. Widmer, Langnau, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/EP95/00191, § 371 Date Jul. 17, 1997, § 102(e) Date Jul. 17, 1997, PCT Pub. No. WO96/22644, PCT Pub. Date Jul. 25, 1996
PCT Filed Jan. 19, 1995, Appl. No. 875,817
Int. Cl.[7] H04J *1/16*
U.S. Cl. 370—254 **7 Claims**



1. Apparatus comprising:

a modem which exchanges data over a transmission medium;

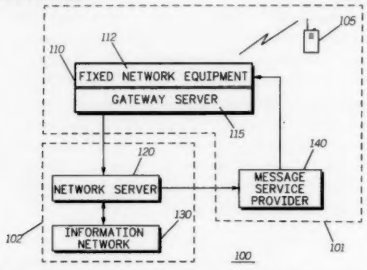
a sensor element;

a configurable converter operatively interconnecting said modem and said sensor element and converting output of said sensor element into digital data which indicates whether a value measured by said sensor element satisfies a condition or not and which in to be transmitted via said transmission medium by said modem; and =p1 a memory which stores externally provided configuration data for use by said configurable converter in performing the conversion, the configuration data being derived from externally provided control condition data referring to said sensor element.

6,041,045
METHOD FOR ACCESSING AN INFORMATION NETWORK FROM A RADIO COMMUNICATION SYSTEM

Steven S. Alterman, Davie; Mauricio E. Sanchez, Pembroke Pines, and Audrey Longhurst, Weston, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1997, Appl. No. 794,560
Int. Cl.[7] H04L *12/46*
U.S. Cl. 370—313 **18 Claims**



1. In a radio communication system, a method for accessing an information network comprising the steps of:

providing gateway equipment with an interface to an external server having access to the information network;

at a two-way radio device operating within the radio communication system:

processing a request for data from the information network;

obtaining a request code identifying data for retrieval from the information network;

transmitting the request code on a wireless communication channel;

at the gateway equipment:

receiving the request code on the wireless communication channel;

determining that the request code corresponds to the information network;

transmitting a request message to the external server, which request message is derived in part from request code and which includes an identifier for the two-way radio device;

at the external server:

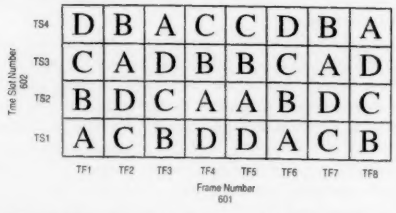
retrieving data from the information network corresponding to the request message; and

communicating the data retrieved to the two-way radio device using the identifier using a service that provides one-way access to the two-way radio device.

6,041,046
CYCLIC TIME HOPPING IN TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM

Logan Scott, Breckenridge, and Claude M. Williams, Colorado Springs, both of Colo., assignors to Omnipoint Corporation, Colorado Springs, Colo.

Filed Jul. 14, 1995, Appl. No. 502,514
Int. Cl.[7] H04J *3/16*
U.S. Cl. 370—319 **17 Claims**



1. A method for communicating comprising the steps of:

generating a plurality of continuous time frames, dividing each of said time frames into a plurality of time slots;

generating, using a root pattern based algorithm, a random pattern; and

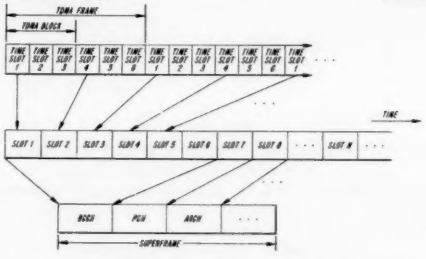
transmitting, from a user station to a base station, in a selected time slot of said plurality of time slots in said each time frame according to said random pattern;

wherein said random pattern is generated by a modulo-n operation on said root pattern and an initial time slot assignment whereby another user station cannot occupy said selected time slot simultaneously in any given time frame within a cellular region.

6,041,047
DIGITAL CONTROL CHANNELS HAVING LOGICAL CHANNELS SUPPORTING BROADCAST SMS

John W. Diachina, Garner, N.C.; Bengt Persson, Djursholm, Sweden; Alex K. Raith, Durham, and Anthony J. Sammarco, Garner, both of N.C., assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of application No. 08/147,254, Nov. 1, 1993, Pat. No. 5,603,081, and a continuation-in-part of application No. 07/956,640, Oct. 5, 1992, Pat. No. 5,404,355, and a continuation of application No. 08/482,754, Jun. 7, 1995, Pat. No. 5,768,276, which is a continuation-in-part of application No. 08/331,703, Oct. 31, 1994, Pat. No. 5,604,744. This application May 11, 1998, Appl. No. 75,203.
Int. Cl.[7] H04B *7/212*
U.S. Cl. 370—347 **8 Claims**



1. A method of transmitting information in a radiocommunication system comprising the steps of:

grouping the information into a plurality of successive time slots on a radio carrier signal, wherein the information includes special messages;

grouping the time slots into a plurality of successive superframes;

designating one or more time slots of each of the successive superframes as a logical special message channel;

grouping the one or more time slots of the logical special message channel into a plurality of successive special messaging superframes;

grouping said special messages as a plurality of logical subchannels, wherein each sub-channel comprises at least a portion of one or more superframes of said plurality of special messaging superframes;

selectively ordering said sub-channels; and

transmitting said sub-channels in said selected order over said logical special message channel.

6,041,048

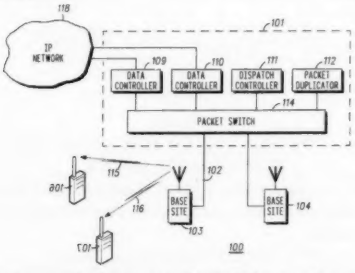
METHOD FOR PROVIDING INFORMATION PACKETS FROM A PACKET SWITCHING NETWORK TO A BASE SITE AND CORRESPONDING COMMUNICATION SYSTEM

Paul M. Erickson, Palatine, and Timothy J. Spets, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 12, 1998, Appl. No. 96,635

Int. Cl.[7] **H04J** *3/24;* **H04Q** *7/00*

U.S. Cl. 370—349 **16 Claims**



1. In a communication system that includes a packet switching network and a base site, the packet switching network supporting a plurality of communication services, a method for providing information packets associated with a first communication service and information packets associated with a second communication service to the base site, the method comprising the steps of:

providing a communication link between the packet switching network and the base site, wherein the communication link has a bandwidth that is substantially equal to an aggregate bandwidth of radio communication resources supported by the base site;

determining at least one attribute of the first communication service and at least one characteristic of the second communication service;

determining that a first attribute of the first communication service is more critical than the at least one characteristic of the second communication service;

modifying the at least one characteristic of the second communication service based on the first attribute of the first communication service to produce at least one modified characteristic;

conveying, via the communication link, the information packets associated with the first communication service and the information packets associated with the second communication service to the base site based on the first attribute of the first communication service;

wherein the first communication service comprises voice service and wherein the first attribute of the first communication service comprises tolerance to time delay variability;

wherein the second communication service comprises packet data and wherein the at least one characteristic of the second communication service comprises packet size and packet rate;

wherein the information packets associated with the second communication service comprise a group of data packets and wherein the step of modifying comprises the steps of:

dividing each data packet of the group of data packets into a respective plurality of data blocks; and

delaying at least one data block of the respective plurality of data blocks to thereby reduce the packet rate.

6,041,049

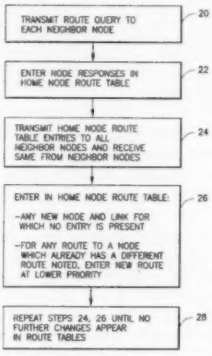
METHOD AND APPARATUS FOR DETERMINING A ROUTING TABLE FOR EACH NODE IN A DISTRIBUTED NODAL SYSTEM

James T. Brady, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1997, Appl. No. 852,019

Int. Cl.[7] **H04J** *1/16*

U.S. Cl. 370—351 **7 Claims**


TRANSMIT ROUTE QUERY TO EACH NEIGHBOR NODE
20
ENTER NODE RESPONSES IN HOME NODE ROUTE TABLE
22
TRANSMIT HOME NODE ROUTE TABLE ENTRIES TO ALL NEIGHBOR NODES AND RECEIVE SAME FROM NEIGHBOR NODES
24
ENTER IN HOME NODE ROUTE TABLE:
-ANY NEW NODE AND LINK FOR WHICH NO ENTRY IS PRESENT
-FOR ANY ROUTE TO A NODE WHICH ALREADY HAS A DIFFERENT ROUTE NOTED, ENTER NEW ROUTE AT LOWER PRIORITY
26
REPEAT STEPS 24, 26 UNTIL NO FURTHER CHANGES APPEAR IN ROUTE TABLES
28

1. A method for enabling each node in a multi-nodal system to construct a route table to all other nodes in the multi-nodal system, each node being either a home node or a neighbor node which is positioned one link away from a home node, each home node performing the method comprising the steps of:

a) transmitting a query to all immediate neighbor nodes, said query inquiring into an identity of each said neighbor node;

b) recording in a route table, responses received from each said neighbor node, each said response identifying a neighbor node at a terminus of a link;

c) transferring to each said neighbor node, route table entries from the home node's route table and receiving route table entries from each said neighbor node; and

d) for each route entry to a destination node indicated by a route table entry received from a said neighbor node:

1) ignoring said each route entry to said destination node if an identical link route is already present that corresponds to said destination node in the route table of the home node;

2) entering a new route entry to said neighbor node if a route to said destination node is not present in the route table of the home node, and

3) if said each route entry to said destination node indicates a route to a node for which there is already a different route entry in the route table of the home node, placing a further route entry to said neighbor node in the table of said home node as a lesser priority route to said destination node.

6,041,050

CELL SELECTOR METHOD AND APPARATUS FOR USE IN TIME DIVISION MULTIPLEXERS AND SWITCHES

Ray W. Sanders, Los Angles, Calif., assignor to Circuit Path Network Systems Corporation, Los Angeles, Calif.

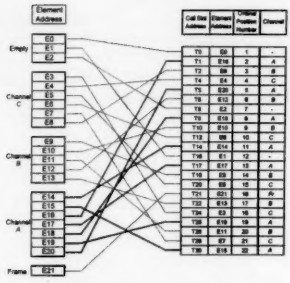
Continuation of application No. 08/606,391, Feb. 23, 1996, abandoned, which is a continuation of application No. 08/538,839, Oct. 4, 1995, Pat. No. 5,502,723, which is a continuation of application No. 08/239,204, May 6, 1994, abandoned. This application Jan. 9, 1997, Appl. No. 783,217.

Int. Cl.[7] **H04J** *3/24*

U.S. Cl. 370—352 **9 Claims**

1. A method for allocating cell slots comprising a frame to one or more channels of a transmission medium, the number of cell slots F comprising the frame being equal to any integer number, said method comprising the steps of:

arbitrarily assigning disjoint subsets of a contiguous range of F element addresses to each of the one or more channels, each



of the subsets comprising a number of the F element addresses equal to the number of the cell slots to be allocated to the channel to which the subset is assigned; and

transforming each of the range of F contiguous element addresses into one of F unique cell slot addresses on a one-to-one basis, wherein each of the F cell slot addresses connotes a relative cell slot position for one of the F cell slots within the frame, and whereby the cell slot addresses derived from said transformation of the element addresses of each assigned subset connote the relative position of cell slots allocated to the channel to which each subset is assigned.

6,041,051

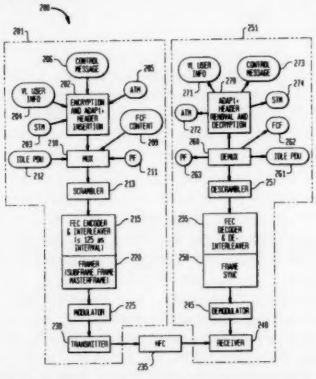
METHOD AND APPARATUS ENABLING MULTIPLE ACCESS FOR MULTIPLE SERVICES AND MULTIPLE TRANSMISSION MODES OVER A BROADBAND COMMUNICATION NETWORK UTILIZING AN ADAPTIVE DIGITAL ACCESS PROTOCOL

Bharat Tarachand Doshi, Holmdel; Subrahmanyam Dravida, Freehold; George John Kustka, Marlboro; Peter D. Magill, Freehold, all of N.J.; Curtis A. Siller, Andover, Mass., and Kotikalapudi Sriram, Marlboro, N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Provisional application No. 60/019,776, Jun. 14, 1996. This application Apr. 3, 1997, Appl. No. 832,255.

Int. Cl.[7] **H04L** *12/66*

U.S. Cl. 370—352 **44 Claims**



1. A method for transmission of synchronous transfer mode (STM) payloads, asynchronous transfer mode (ATM) payloads, and asynchronous variable length (VL) payloads over a bi-directional broadband communications network having a source and a destination, said method comprising the steps of:

dividing said transmission into a series of successive time subframes;

partitioning each of said time subframes into at least a first region, a second region, and a third region;

demarcating a first boundary between said first region and said second region;

demarcating a second boundary between said second region and said third region;

allocating at least one time slot within said first region for transmission of said STM payloads whenever said STM payloads are queued at said source for transmission to said destination;

designating said second region for transmission of said ATM payloads, wherein an individual ATM cell of said ATM payload is allowed to cross successive second region boundaries; and designating said third region for transmission of said asynchronous VL payloads;

wherein an individual VL data unit of said VL payload is allowed to cross successive third region boundaries.

6,041,052

CALL CONTROL SYSTEM FOR A SUBSCRIBER TRANSMISSION DEVICE

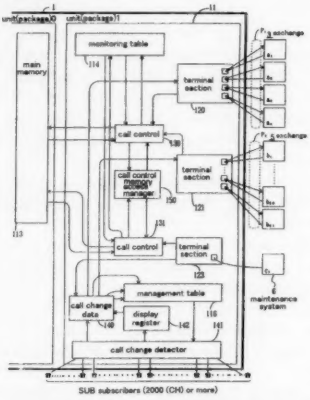
Shoji Miyake; Toru Inaba, both of Yokohama, and Eiji Koda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 3, 1997, Appl. No. 792,063

Claims priority, application Japan, Feb. 2, 1996, 8-017366

Int. Cl.[7] **H04J** *3/12;* **H04M** *7/06;* **H04Q** *11/04*

U.S. Cl. 370—360 **25 Claims**



1. A call control system for use in a subscriber transmission device located along a transmission path between subscribers and exchanges for performing upon requests from the exchanges, connection and disconnection of the subscribers with the transmission path, the call control system comprising:

plural call control message terminal sections, each provided for one of different protocols, each supported by one of groups of exchanges, for terminating a data link for sending and receiving a call control message to and from a corresponding exchange; and

a call change data processor for detecting call and clearance by a subscriber, and for requesting one of the plural call control message terminal sections, which is provided for a protocol supported by a group of exchanges to one of which the subscriber is connected, to transmit detected contents of the call and clearance to the corresponding exchange.

6,041,053

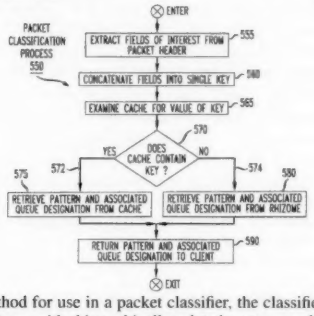
TECHNIQUE FOR EFFICIENTLY CLASSIFYING PACKETS USING A TRIE-INDEXED HIERARCHY FOREST THAT ACCOMMODATES WILDCARDS

John R. Douceur, Bellevue; Ofer Bar, Newcastle, and Yoram Bernet, Seattle, all of Wash., assignors to Microsfot Corporation, Redmond, Wash.

Filed Sep. 18, 1997, Appl. No. 933,476

Int. Cl.[7] **H04L** *12/28;* **G06F** *17/30;15/16*

U.S. Cl. 370—389 **53 Claims**



1. A method for use in a packet classifier, the classifier having a data structure with hierarchically-related pattern values stored therein, said pattern values having wildcards therein; wherein the data structure has a search trie and a hierarchy forest, the search trie being formed of a plurality of branch nodes organized into a binary search trie extending from a root node therein to said hierarchy forest, the hierarchy forest having a plurality of pattern nodes, each having a different corresponding one of the pattern values associated therewith, and at least one hierarchy of pattern nodes with associated pattern values of increasing generality; the method comprising the steps of:

forming a key in response to information contained in a portion of the packet;

traversing along a path through the search trie in order to reach one of the pattern nodes in said hierarchy forest, the path being defined by the key and pivot bit values associated with ones of said branch nodes;

determining whether the key either matches or is subsumed by a pattern value stored in said one pattern node or in a different one of pattern nodes situated at an increasingly higher level of a hierarchy containing said one pattern node, so as to locate a desired one of the pattern values, stored in the hierarchy, that either identically matches or most specifically subsumes the key; and

if the key identically matches or is subsumed by the desired one pattern value:

accessing a stored classification associated with said desired one pattern value; and

returning the stored classification for the packet.

6,041,054

EFFICIENT TRANSPORT OF INTERNET PROTOCOL PACKETS USING ASYNCHRONOUS TRANSFER MODE ADAPTATION LAYER TWO

Lars Westberg, Enköping, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 24, 1997, Appl. No. 936,116

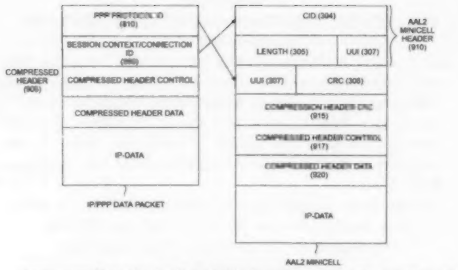
Int. Cl.[7] **H04Q** *11/04*

U.S. Cl. 370—389 **20 Claims**

1. A method for transporting internet protocol data packets in a network environment, wherein said internet protocol data packets include a header portion, said method comprising the steps of:

storing a portion of the internet protocol data packet header at a location in a look-up table;

mapping the portion of the internet protocol data packet header stored in the look-up table by inserting an address into a portion of an AAL2 minicell header, wherein the address



corresponds to the look-up table location where the portion of the internet protocol data packet header is stored;

inserting a remaining portion of the internet protocol data packet header into a payload portion of the AAL2 minicell;

transmitting the AAL2 minicell to a receiving point in the network;

analyzing the address inserted into the AAL2 minicell header;

retrieving the portion of the internet protocol data packet header stored in the look-up table based on the address in the AAL2 minicell header.

6,041,055

MULTIPURPOSE SYNCHRONOUS SWITCH ARCHITECTURE

Geoffrey Chopping, Wimborne, United Kingdom, assignor to Marconi Communications Limited, United Kingdom

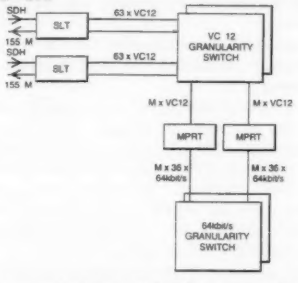
PCT No. PCT/GB95/00661, § 371 Date Oct. 24, 1996, § 102(e) Date Oct. 24, 1996, PCT Pub. No. WO95/26600, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 23, 1995, Appl. No. 716,253

Claims priority, application United Kingdom, Mar. 25, 1994, 9405993

Int. Cl.[7] **H04L** *12/28;12/56;12/50;* **H04Q** *11/00*

U.S. Cl. 370—391 **3 Claims**



1. A telecommunications switch fabric, comprising: at least a first switch and a second switch, said first and second switches having different higher and lower granularities, a terminating device for connecting the first and second switches together, and including terminating and multiplexing/demultiplexing means, for terminating and demultiplexing the higher granularity circuits from the first switch into the lower granularity circuits for the second switch, and for multiplexing the lower granularity circuits from the second switch together to form the higher granularity circuits for the first switch, and only one of the first and second switches having external connections which are not connected to another switch of the switch fabric.

6,041,056
FULL SERVICE NETWORK HAVING DISTRIBUTED ARCHITECTURE

John A. Bigham, Pottstown, Pa.; Dave Little, Columbia, Md.; Edward C. Mihm, Warminster, Pa.; Kamran Sistanizadeh, Arlington, Va.; Bahman Amin-Salehi, Washington, D.C.; Alpna Jain, Falls Church, Va.; Regina Lightfoot, New Carrollton, and Ulric E. Arthur, Burtonsville, both of Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation of application No. 08/413,215, Mar. 28, 1995. This application Sep. 29, 1997, Appl. No. 942,690.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H04J *3/24*
U.S. Cl. 370—395 **8 Claims**

1. A communication system for transporting compressed digital video data between a plurality of video information providers VIPs and video information users VIUs comprising:

a first hub receiving a first ATM cell stream carrying compressed broadcast digital video from the video information providers, the first hub comprising:

(1) a first transport multiplexer that receives the first ATM cell stream, and repackets selected ATM cells from said received first ATM cell stream into MPEG format data units assigned PID values based on the VPI/VCI value of the selected ATM cells, the first transport multiplexer outputting a first broadband data stream of the MPEG format data units carrying the compressed broadcast digital video and a first narrowband data stream,

(2) a quadrature amplitude modulation QAM modulator for modulating the first broadband data stream into at least one Intermediate Frequency analog IF channel having a prescribed bandwidth,

(3) an RF upconverter upconverting the IF analog channel and outputting the upconverted IF analog channel as an RF channel,

(4) a QPSK modulator configured for modulating the first narrowband data stream into first modulated narrowband data signals, and

(5) an RF combiner combining the RF channel carrying the first broadband data stream and the first modulated narrowband data signals into a first combined RF signal, the RF combiner outputting the first combined RF signal onto an optical fiber;

an ATM backbone carrying a second ATM cell stream carrying compressed interactive digital video from the video information providers;

a second hub receiving the second ATM cell stream from the ATM backbone and the first combined RF signal, the second hub comprising:

(1) a second transport multiplexer that receives the second ATM cell stream, and repackets selected ATM cells from said received second ATM cell stream into MPEG format data units having assigned PID values based on the VPI/VCI value of the selected ATM cells, the second transport multiplexer outputting a second broadband data stream of the MPEG format data units carrying the compressed interactive digital video and a second narrowband data stream,

(2) a second quadrature amplitude modulation QAM modulator for modulating the second broadband data stream into at least one secondary Intermediate Frequency IF analog channel having a second prescribed bandwidth,

(3) a second RF upconverter upconverting the secondary IF analog channel and outputting the upconverted secondary IF analog channel as a second RF channel, and

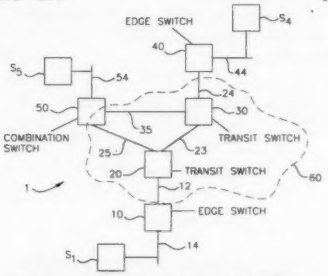
(4) a second QPSK modulator configured for modulating the second narrowband data stream into second modulated narrowband data signals; and

a hybrid fiber coaxial transmission network coupled to the second hub and supplying the first combined RF signal, the second RF channel, and second modulated narrowband data signals to the VIUs.

6,041,057
SELF-CONFIGURING ATM NETWORK

Geoffrey C. Stone, Malibu, Calif., assignor to Xylan Corporation, Calabasas, Calif.

Filed Mar. 24, 1997, Appl. No. 823,078
Int. Cl.[7] H04L *12/28*
U.S. Cl. 370—397 **30 Claims**



1. A method for sharing topology information in a self-configuring ATM network, comprising:

interconnecting n switches, where n is an integer greater than two;

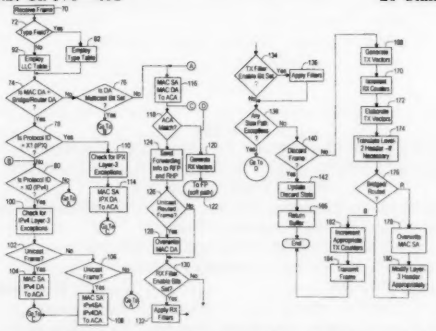
on a first of said n switches, receiving a first set of topology messages from a set of neighboring switches, said first set of topology messages encoded with related pairs of switch identifiers and path cost information for particular ones of said n switches;

on said first switch, after receiving said first set of topology messages, generating and forwarding a second set of topology messages to said set of neighboring switches, said second set of topology messages encoded with related pairs of switch identifiers, VLAN information and path cost information for particular ones of said n switches, including at least related pairs of switch identifiers and path cost information for said first switch and said particular ones of said n switches included in said first set of topology messages.

6,041,058
HARDWARE FILTERING METHOD AND APPARATUS

John A. Flanders, Ashland; David C. Ready, Westwood; Steven Van Seters, Stow; Leonard Schwartz, Bedford, and William D. Townsend, Groton, all of Mass., assignors to 3Com Corporation, Santa Clara, Calif.

Filed Sep. 11, 1997, Appl. No. 928,882
Int. Cl.[7] H04J *3/02;3/24*
U.S. Cl. 370—401 **20 Claims**



1. Apparatus for facilitating processing of a data unit in a bridge/router device, comprising:

at least one input port operative to receive the data unit;

a received frame circuit operative to determine whether a source address in the header of the data unit matches at least one address in a cache, and further operative to determine whether

a destination address in the header of the data unit matches at least one address in the cache, and to provide a first indication in the event that the source address matches at least one address in the cache and the destination address matches at least one address in the cache, and to otherwise provide a second indication;

at least one filter logic circuit, operative to examine, responsive to the first indication, a header portion of the data unit to determine whether the data unit is in a first predetermined category and to filter the data unit if the data unit is determined to be in the first predetermined category, the at least one filter logic circuit including at least one filter logic circuit selected from the group consisting of a Protocol Type filter, a Port Group filter, a Media Access Control Address Group filter, a non-unicast traffic filter and a Combination filter; and

a microprocessor, operative to execute, responsive to the second indication, software that determines whether the data unit is in a second predetermined category and that filters the data unit if the data unit is determined to be in a second predetermined category.

6,041,059

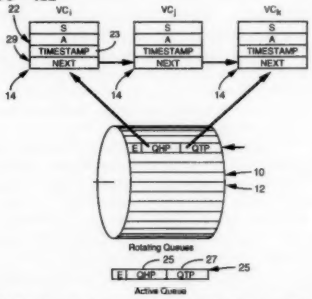
TIME-WHEEL ATM CELL SCHEDULING

Alexander Joffe, Palo Alto, and Ari Birger, Sunnyvale, both of Calif., assignors to MMC Networks, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1997, Appl. No. 845,710

Int. Cl.[7] **H04L** *12/28;12/56*

U.S. Cl. 370—412 **11 Claims**



1. A method of operating a cell scheduler for asynchronous time mode transfer of virtual channel entries at predetermined cell transmission time intervals, the cell scheduler comprising a plurality of queues of a first type, at least one queue of a second type, and means for transferring virtual channel entries among the first and the second queue, the method comprising at each interval:

iteratively selecting one of the queues of the first type;

if the selected queue has at least one entry, transferring all entries of the first type from the selected queue to a queue of the second type;

if the queue of the second type has at least one entry, transmitting an entry at a head of the queue of the second type, the entry at the head of the queue of the second type having a step;

if a period of time elapsed since the entry at the head of the queue of the second type was last transmitted is less than the step of the entry at the head of the queue of the second type, appending said entry at the head of the queue of the second type to a tail of one of the queues of the first type; and

if a period of time elapsed since the entry at the head of the queue of the second type was last transmitted is not less than the step of the entry at the head of the queue of the second type, appending the entry at the head of the queue of the second type to a tail of the queue of the second type.

6,041,060

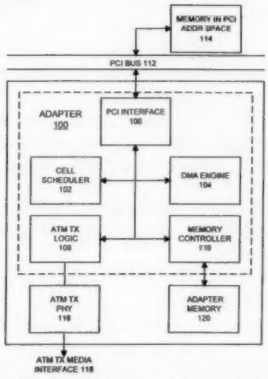
COMMUNICATIONS CELL SCHEDULER AND SCHEDULING METHOD FOR PROVIDING PERIODIC ACTIVITIES

Philip Lynn Leichty, Rochester, and Albert Alfonse Slane, Oronoco, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1997, Appl. No. 846,565

Int. Cl.[7] **H04L** *12/28;12/56*

U.S. Cl. 370—412 **14 Claims**



1. A scheduling method for providing periodic activities and predetermined events comprising the steps of:

enqueuing a timer descriptor to a cell scheduler timing wheel;

providing said timer descriptor with predetermined fields including a flag field indicating a relative or absolute timer type;

identifying a timer expiration for said timer descriptor;

fetching an address for a DMA descriptor from said timer descriptor, and

enqueuing said DMA descriptor to a DMA engine to execute said DMA descriptor.

6,041,061

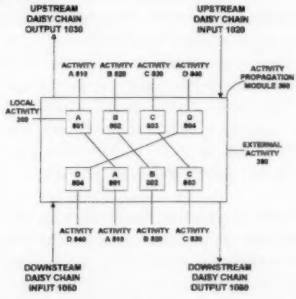
INTERNAL ARBITER FOR A REPEATER IN A COMPUTER NETWORK

Ming-Chang Su, Hsinchu, Taiwan, assignor to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Jan. 31, 1997, Appl. No. 794,279

Int. Cl.[7] **H04L** *12/43*

U.S. Cl. 370—461 **6 Claims**



1. An internal arbitration module for a repeater in a computer network, comprising:

a plurality of activity inputs, including a local activity input, indicating activity on a local repeater, and other activity inputs, indicating activity on other repeaters;

a plurality of activity outputs, wherein each activity output is coupled to a corresponding activity input;

at least one daisy chain input;

at least one daisy chain output, which is asserted when any of said at least one daisy chain input and said plurality of activity inputs are asserted; and

an external activity output, indicating activity on external repeaters, which is asserted when any of said at least one daisy chain input and other activity inputs are asserted.

6,041,062

HIGH-SPEED SYNCHRONOUS MULTIPLEXING APPARATUS

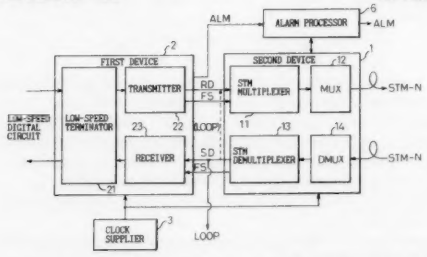
Seiichi Yamato; Noboru Kamei; Kazuyoshi Okuma; Katsumi Sugawa; Hironori Kadota, and Tomoyuki Sakata, all of Fukuoka, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 13, 1997, Appl. No. 874,358

Claims priority, application Japan, Jun. 13, 1996, 8-152080; Jun. 11, 1997, 9-153961

Int. Cl.[7] **G01R** *31/08;* **G06F** *11/00;* **G08C** *15/00;* **H04J** *3/16*

U.S. Cl. 370—465 **35 Claims**



1. A high-speed synchronous multiplexing apparatus having a first communication device connected to and accommodating a low-speed digital circuit and a second communication device connected to a high-speed synchronous multiplexing circuit, comprising:

clock supply means for supplying a reference clock signal, which sets a communication rate, to each of the first and second communication devices;

alarm processing means for separately detecting faults from the first communication device and second communication devices and performing respective alarm proceedings;

a first communication device for receiving data from the low-speed digital circuit, preparing serial low-speed data from the received data in synchronization with the reference clock signal, and transmitting the serial low-speed data with a frame signal to the second communication device via separated data and frame signal lines, and for receiving serial low-speed data with a frame signal from the second communication device and sending the received data to the low-speed digital circuit; and

the second communication device for receiving the serial low-speed data with a frame signal from the first communication device and sending the received data as a high-speed synchronous multiplexed signal to the high-speed synchronous multiplexing circuit, and for receiving a high-speed synchronous multiplexed signal from the high-speed synchronous multiplexing circuit, preparing serial low-speed data from the high-speed synchronous multiplexed signal in synchronization with the reference clock signal, and transmitting the low-speed serial data with a frame signal to the first communication device via separated data and frame signal lines.

6,041,063

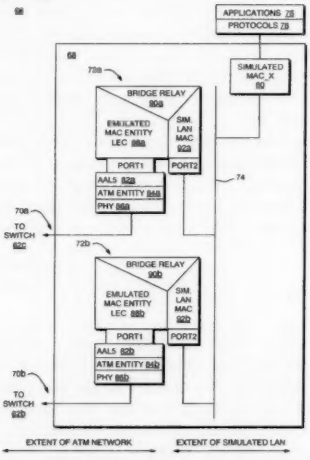
HIGH AVAILABILITY, SCALEABLE BANDWIDTH, MULTIPORT ATM-EMULATED LAN INTERFACE

Lars Povlsen, Dragoer; Erling Skjoldborg, Lyngby, and Tomasz Jerzy Goldman, Hellerup, all of Denmark, assignors to Olicom A/S, Denmark

Filed Sep. 16, 1997, Appl. No. 931,555

Int. Cl.[7] **H04J** *3/16;* **H04L** *12/28*

U.S. Cl. 370—465 **15 Claims**



1. Apparatus for providing local area network (LAN) emulated communication between an asynchronous transfer mode (ATM) network and a host, said apparatus comprising:

a plurality of network interface cards each of which has a port connected in communicating relationship with said ATM network, each of said cards having an associated LAN emulation client (LEC), and a single, common media access control (MAC) address assigned to said host; and

a controller for directing communications between said LECs and a simulated MAC entity associated with said host, said controller operable to dynamically select one or more of said LECs for receiving frames from said ATM network, filtering frames received by said LECs so as to prevent duplicate frames from being passed to said simulated MAC entity, and causing frames received from said simulated MAC entity to be passed to one or more selected LECs for transmission to said ATM network.

6,041,064

VOICE SERVER MODULE FOR ATM SWITCH

James Patrick Kurdzo, Watertown, and Robert Alan Zakrzewski, Meriden, both of Conn., assignors to General DataComm, Inc., Middlebury, Conn.

Filed Jan. 29, 1998, Appl. No. 15,303

Int. Cl.[7] **H04L** *12/66*

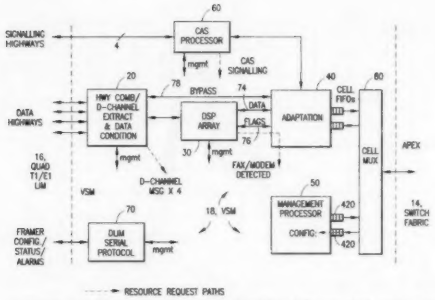
U.S. Cl. 370—466 **14 Claims**

1. A module for an ATM switch, comprising:

a) interface means for receiving telecommunications data, said telecommunications data including voice data and non-voice data;

b) voice data processing means coupled to said interface means, said voice data processing means for receiving said voice data, and for processing said voice data and not said non-voice data so as to conduct at least one of echo cancellation on and data encoding of said voice data; and

c) adaptation processing means coupled to said voice data processing means and coupled by a bus to said interface means, said adaptation processing means for receiving said non-voice data via said bus, for processing said non-voice data so that said non-voice data conforms to an AAL1-type format, for receiving said voice data from said voice data processing



means, and for processing said voice data so that said voice data conforms to an AAL2-type format.

6,041,065

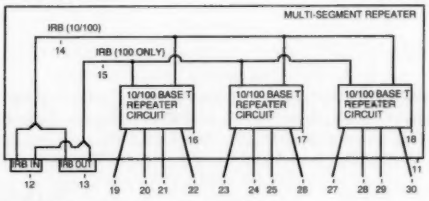
FLEXIBLE MULTI-FREQUENCY REPEATER

Bruce W. Melvin, Roseville, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 13, 1997, Appl. No. 910,652

Int. Cl.[7] **A61K** *9/20;9/22;9/16*

U.S. Cl. 370—492 **17 Claims**



1. A multi-segment repeater comprising:

a first inter-repeater bus;

a second inter-repeater bus; and,

a first repeater circuit, coupled to the first inter-repeater bus and the second inter-repeater bus, comprising:

a 10 megabit repeater core,

a first 100 megabit repeater core,

a second 100 megabit repeater core,

a selector for selecting whether the 10 megabit repeater core is to be connected to the first inter-repeater bus and whether the first 100 megabit repeater core is to be connected to the first inter-repeater bus, and

connection means for connecting the second 100 megabit repeater core to the second inter-repeater bus, wherein the 10 megabit repeater core is not connectable to the second inter-repeater bus.

6,041,066

METHOD OF SYNCHRONIZATION STATUS MESSAGE PROCESSING IN TRANSMISSION APPARATUS

Seiji Meki; Shunji Yamada, both of Kanagawa, and Junichi Moriyama, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

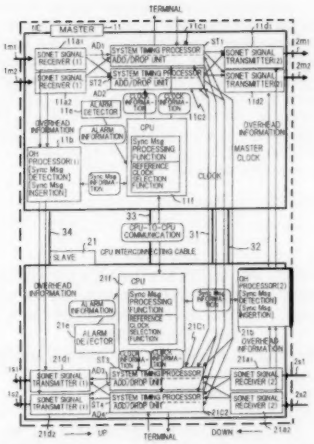
Filed Feb. 12, 1998, Appl. No. 22,429

Claims priority, application Japan, Jan. 9, 1997, 9-235759

Int. Cl.[7] **H04J** *3/06*

U.S. Cl. 370—512 **12 Claims**

1. A method of synchronization status message processing in a transmission apparatus equipped with a plurality of units to which main signals are input for subjecting these main signals to predetermined processing and then transmitting the main signals, one of these units being a master unit and the others being slave units, the master unit deciding, as a master clock, a clock extracted from a main signal into which a synchronization status message indicative



of best quality level has been inserted from among synchronization status messages inserted into the main signals input to each of the units, each unit executing signal processing in synchronization with this master clock, the method comprising the steps of:

connecting the master unit and the slave units by a clock cable which sends and receives a clock and a processor interconnecting cable for communication between processors provided in the master unit and the slave units;

identifying, in each slave unit, a synchronization status message that has been inserted into a main signal input from a line and notifying the master unit of this synchronization status message via the processor interconnecting cable; and

obtaining, in the master unit, a synchronization status message indicating best quality level using synchronization status messages acquired from the master units and synchronization status messages acquired from the slave units, and adopting, as a master clock, a clock extracted from a main signal in which the synchronization status message obtained has been inserted.

6,041,067

DEVICE FOR SYNCHRONIZING DATA PROCESSING

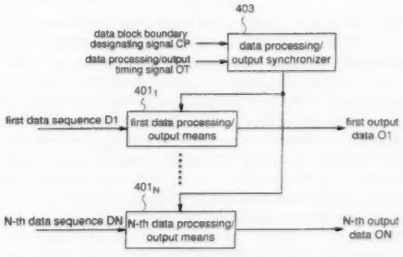
Hiroki Takamori, Osakasi, and Takayuki Morisige, Ujisi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 3, 1997, Appl. No. 943,198

Claims priority, application Japan, Oct. 4, 1996, 8-264301

Int. Cl.[7] **H04J** *3/06*

U.S. Cl. 370—514 **34 Claims**



1. A device for synchronizing data processing, receiving N (N=integer, $1 \leqq N$) pieces of data sequences, each sequence comprising plural data blocks, said device comprising:

N data processing/output means, each means for processing data included in an input data sequence and outputting processed data, according to synchronous information; and

means of synchronizing data processing/output, which updates a reference of synchronization, according to a data block boundary designating information that shows boundaries of data blocks constituting N pieces of data sequences, and outputs the synchronous information to the N data processing/output means, according to data processing/output timings of the N pieces of data sequences, so that the N data processing/output means are synchronized with each other and process and output data in the respective data sequences in correct timings along the temporal order.

6,041,068

METHOD AND APPARATUS FOR MULTIPLEXING AND TRANSMITTING AUTONOMOUSLY/INTRA CODED PICTURES ALONG WITH THE MAIN OR I, P, B PICTURES/VIDEO

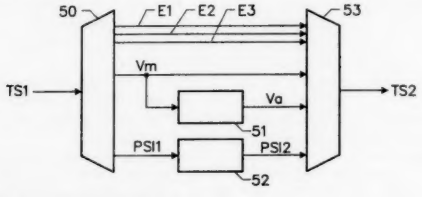
Jürgen F. Rosengren; Ronald W. J. J. Saeijs, and Eric H. J. Persoon, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of application No. 08/422,378, Apr. 14, 1995, abandoned. This application Aug. 11, 1997, Appl. No. 909,144.

Claims priority, application European Pat. Off., Apr. 15, 1994, 94201053

Int. Cl.[7] **H04J** *3/02;* **H04N** *7/12;9/74;5/445*

U.S. Cl. 370—538 **22 Claims**



1. A transmitter comprising:

means for generating a main elementary video stream that includes autonomously encoded pictures and predictively encoded pictures;

means for selecting from the main elementary video stream only the autonomously encoded pictures;

means for arranging the autonomously encoded pictures to generate an ancillary elementary video stream;

means for multiplexing the main elementary video stream and the ancillary elementary video stream to generate a transport stream; and,

means for transmitting the transport stream wherein the transport stream is transmitted over a transmission channel to a receiver that is located remotely from the transmitter.

6,041,069

LASER DEVICE TUNED BY FORMING A REFRACTIVE INDEX GRATING IN OPTICAL FIBER

Raman Kashyap, and Jonathan Richard Armitage, both of Ipswich, United Kingdom, assignors to British Telecommunications public limited company, London, United Kingdom

Continuation of application No. 08/609,485, Mar. 1, 1996, abandoned, which is a continuation of application No. 08/263,749, Jun. 22, 1994, abandoned, which is a division of application No. 07/940,960, Nov. 3, 1992, Pat. No. 5,377,288. This application Jun. 18, 1997, Appl. No. 877,997.

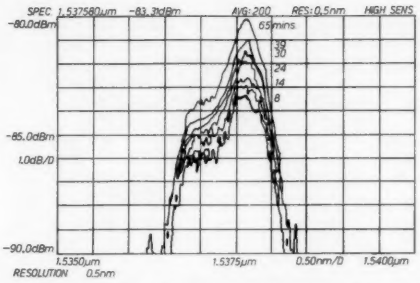
Claims priority, application United Kingdom, Apr. 6, 1990, 9007912

Int. Cl.[7] **H01S** *3/30*

U.S. Cl. 372—6 **10 Claims**

1. A rare earth doped fibre laser including first and second fibres, the first optical fibre including a laser-active rare-earth dopant, and

the second optical fibre being photosensitive to enable a refractive index grating to be recorded therein and being optically coupled to the first fiber, said second optical fibre including a reflector comprising a refractive index grating formed in its core, the grating having been formed by exposing the second fibre to a first spatially periodic pattern of optical radiation such that said first pattern becomes recorded in the core of the second fibre, the spatial periodic pattern having been configured such that the laser operates with a selected predetermined wavelength with an extremely narrow bandwidth, determined by the spatially periodic pattern, and is selectively tunable for extremely narrow bandwidth operation at a different wavelength by exposing the second fibre to a second spatially periodic pattern of optical radiation such that said second pattern becomes recorded in the core.



6,041,070

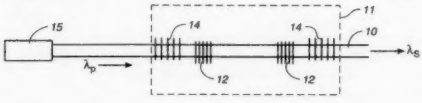
RESONANT PUMPED SHORT CAVITY FIBER LASER

Thomas L. Koch, Holmdel, N.J., and Robert Waarts, Fremont, Calif., assignors to SDL, Inc., San Jose, Calif.

Filed Nov. 14, 1997, Appl. No. 970,745

Int. Cl.[7] **H01S** *3/07*

U.S. Cl. 372—6 **73 Claims**



1. An optical source for generating a predetermined optical signal comprising a predetermined signal wavelength, the source comprising:

an optical gain medium;

a pump resonator that establishes a resonant cavity for optical energy at a pump wavelength suitable for optically pumping the gain medium, the resonant cavity including the gain medium; and

an optical pump source external to the resonant cavity that directs optical energy at the pump wavelength into the resonant cavity.

6,041,071

ELECTRO-OPTICALLY TUNABLE EXTERNAL CAVITY MIRROR FOR A NARROW LINEWIDTH SEMICONDUCTOR LASER

Parviz Tayebati, Watertown, Mass., assignor to CoreTek, Inc., Burlington, Mass.

Provisional application No. 60/004,620, Sep. 29, 1995, Provisional application No. 60/004,940, Oct. 4, 1995. This application Sep. 27, 1996, Appl. No. 726,049.

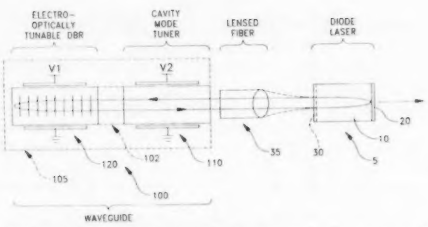
Int. Cl.[7] **H01S** *3/03*

U.S. Cl. 372—64 **26 Claims**

1. A tunable external cavity waveguide device, said waveguide device comprising:

a ferroelectric electro-optical substrate;

a waveguide formed in said substrate;



a distributed Bragg reflector (DBR) disposed adjacent a portion of said waveguide; and

means for applying a voltage difference across said distributed Bragg reflector,

wherein said substrate has an index of refraction, wherein said waveguide is formed in said substrate by inducing a strain field within said substrate, and wherein said strain field forms graduated variations in the index of refraction of said substrate without altering the chemical composition of said substrate.

6,041,072

APPARATUS FOR STABILIZING MULTIPLE LASER SOURCES AND THEIR APPLICATION

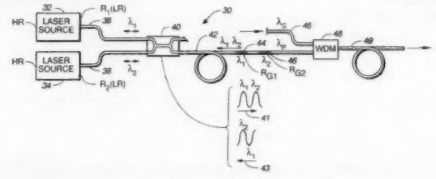
Brian F. Ventrudo, and Peter G. Berrang, both of Victoria, Canada, assignors to SDL, Inc., San Jose, Calif.

Continuation of application No. 08/773,016, Dec. 24, 1996, Pat. No. 5,841,797, which is a continuation-in-part of application No. 08/415,129, Mar. 30, 1995, Pat. No. 5,589,684, which is a continuation-in-part of application No. 08/267,785, Jun. 28, 1994, Pat. No. 5,485,481. This application May 19, 1998, Appl. No. 81,528.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H01S *3/10*

U.S. Cl. 372—102 **43 Claims**



1. Apparatus for providing a stable laser pump source comprising:

a plurality of semiconductor laser pump sources having respective lasing cavities capable of lasing within a narrow bandwidth of wavelengths and providing spectral beam outputs at their respective laser exit facets at least one of which having distinguishable optical characteristics from one another;

an optical element to optically combine said beam outputs into a single beam output;

an optical fiber coupled to receive said single beam output;

at least one fiber grating formed in said apparatus, said at least one fiber grating having a reflectivity band for reflecting a portion of either of said spectral beam outputs or of said single beam back into at least one of said laser pump sources for providing a small portion of selected wavelengths within a gain bandwidth of said at least one of laser pump sources suppressing the magnitude of intensity noise in said single beam output.

6,041,073

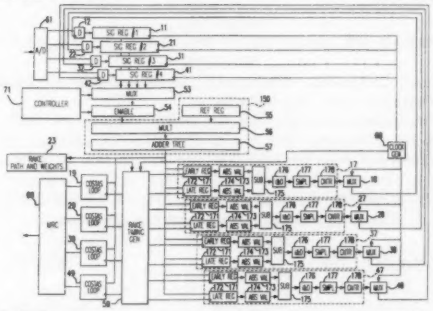
MULTI-CLOCK MATCHED FILTER FOR RECEIVING SIGNALS WITH MULTIPATH

Sorin Davidovici, Oceanpoint; Jimmy Cuong Tran, Jackson, and Emmanuel Kanterakis, North Brunswick, all of N.J., assignors to Golden Bridge Technology, Inc., West Long Branch, N.J.

Filed Sep. 18, 1998, Appl. No. 157,300

Int. Cl.[7] H04B *1/69*

U.S. Cl. 375—148 **12 Claims**



1. An improvement, to a spread-spectrum receiver, for receiving, in a multipath environment, a spread-spectrum signal having data spread by a chip-sequence signal, with each chip of the chip-sequence signal having a chip duration, with the spread-spectrum signal arriving from a plurality of paths from the multipath environment, comprising:

a clock-signal generator for generating a clock signal, with the clock signal, during a chip duration, having a plurality of phases, with a number of phases of the plurality of phases at least equal to a number of paths of the plurality of paths;

an analog-to-digital converter for sampling the spread-spectrum signal to generate, during the chip duration, a plurality of chip samples, with a number of chip samples in the plurality of chip samples at least equal to the number of phases in the plurality of phases, said analog-to-digital converter, responsive to each chip sample of the plurality of chip samples, for converting each chip sample to a digital-chip sample, thereby generating a plurality of digital-chip samples;

a plurality of signal registers, coupled to said analog-to-digital converter, for storing the plurality of digital-chip samples;

a plurality of gates, coupled between said plurality of signal registers, respectively, and said analog-to-digital converter, each of said plurality of gates responsive to a set of phase signals, respectively, from a multiplicity of sets of phase signals, for passing a respective number of the plurality of digital-chip samples into a respective signal register of the plurality of signal registers;

a signal-register multiplexer, coupled to each of the plurality of signal registers, said signal-register multiplexer responsive to a register-select signal, for selecting a respective signal register from the plurality of signal registers;

a matched filter, coupled to said signal-register multiplexer, and having an impulse response matched to the spread-spectrum signal, for detecting an early portion, a punctual portion and a late portion of each chip embedded in the spread-spectrum signal for each path of the plurality of paths, respectively;

a RAKE-timing generator for generating a plurality of path-select signals corresponding to the plurality of paths from the multipath environment;

a plurality of delay-locked-loop (DLL) path-tracking circuits, with each DLL path-tracking circuit responsive to a respective path-select signal of the plurality of path-select signals, for gating the early portion and the late portion, corresponding to a respective path, of a detected spread-spectrum signal, into the respective DLL path-tracking circuit, and for generating a DLL signal of a plurality of DLL signals; and

a plurality of DLL multiplexers coupled to said clock-signal generator, to said plurality of DLL path-tracking circuits, and to said plurality of gates, respectively, each DLL multiplexer

of said plurality of DLL multiplexers, responsive to a respective DLL signal from a respective DLL path-tracking circuit, for passing a respective set of phases of the plurality of phases from said clock-signal generator to a respective gate of said plurality of gates, with said plurality of DLL multiplexers thereby generating a multiplicity of sets of phase signals, respectively.

6,041,074

SPREAD SPECTRUM PULSE POSITION MODULATION SYSTEM

Masaru Nakamura, Edahigashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

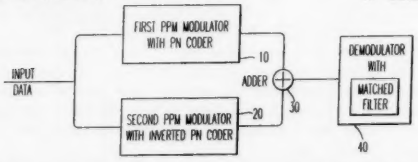
Continuation of application No. 08/878,903, Jun. 19, 1997, Pat. No. 5,884,134, which is a continuation of application No. 08/862,647, May 23, 1997. This application Jan. 14, 1999, Appl. No. 229,896.

Claims priority, application Japan, May 24, 1996, 8-151917

This patent is subject to a terminal disclaimer.

Int. Cl.[7] H04B *1/69*

U.S. Cl. 375—200 **69 Claims**



1. A spread spectrum pulse position modulation/demodulation system receiving an input signal including frames, comprising:

a first pulse position modulator modulating each frame by inserting a first pseudo noise code into a selected slot of each frame according to the input signal to generate a first spread spectrum pulse position modulating signal;

a second pulse position modulator modulating each frame by inserting a second pseudo noise code into a selected slot of each frame according to the input signal to generate a second spread spectrum pulse position modulating signal, wherein the second pseudo noise code is an inversion of the first pseudo noise code;

an adder adding together the first and second spread spectrum pulse position modulating signals to generate a third spectrum pulse position modulating signal as a base band signal;

a demodulator receiving the third spread spectrum pulse position modulating signal and demodulating the third spread spectrum pulse position modulating signal, the demodulator including only one matched filter to output a first pulse signal corresponding to the first spread spectrum pulse position modulating signal and to output a second pulse signal corresponding to the second spread spectrum pulse position modulating signal.

6,041,075

SCHEME FOR THE DETECTION OF V.25 TER RESPONSES FROM MODEM, ON A TAP1 VOICE CALL

Ramesh Caushik, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1997, Appl. No. 939,610

Int. Cl.[7] H04B *1/38*

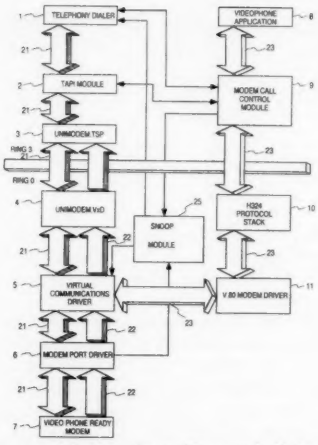
U.S. Cl. 375—222 **15 Claims**

1. A method comprising the steps of:

initiating a snoop of a port to detect a request to enter an ancillary mode;

transmitting in parallel data from the port to a usual recipient and a snooping module;

identifying in the snooping module if the data is a request to enter the ancillary mode; and



initiating a transition into the ancillary mode if the request is identified.

6,041,076

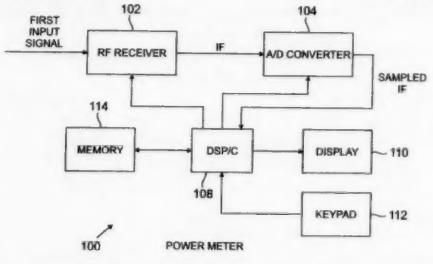
DIGITALLY MODULATED CATV POWER MEASUREMENT USING UNDERSAMPLING

Douglas J. Franchville, Indianapolis, and Daniel K. Chappell, Fishers, both of Ind., assignors to Wavetek Corporation, Indianapolis, Ind.

Filed Dec. 2, 1997, Appl. No. 982,831

Int. Cl.[7] H04B *17/00;3/46;* **H04Q** *1/20*

U.S. Cl. 375—224 **20 Claims**



1. An apparatus for measuring power of a first signal, the first signal comprising a carrier signal modulated by an information signal, the first signal having a signal strength spectrum that approximates a signal strength spectrum of white noise, the apparatus comprising:

a) an RF receiver for receiving the first signal and generating an intermediate signal therefrom, the intermediate signal comprising at least a portion of the first signal and having a bandwidth and a cutoff frequency;

b) an A/D stage operably connected to the RF receiver to receive the intermediate signal therefrom, said A/D stage operable to generate a digital intermediate signal from the intermediate signal, the digital intermediate signal having a sample rate of less than twice the cut-off frequency;

c) a digital signal processing circuit operable to generate a power measurement on the digital intermediate signal using a sufficient number of samples of the digital intermediate signal to reduce an error due to undersampling to below a predetermined amount, the power measurement representative of the power of at least a portion of the first signal.

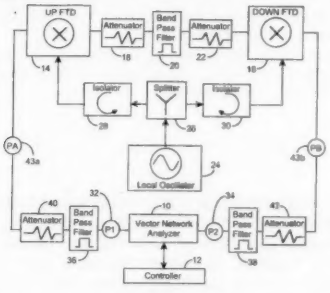
6,041,077
FREQUENCY TRANSLATING DEVICE TRANSMISSION RESPONSE METHOD

Christopher Joseph Clark, Hermosa Beach; Andrew Alfred Moulthrop, Culver City; Michael Steven Muha, Torrance, and Christopher Patrick Silva, Lomita, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Continuation of application No. 08/865,276, May 28, 1997, Pat. No. 5,937,006, and a continuation of application No. 08/940,578, Sep. 30, 1997. This application May 4, 1999, Appl. No. 305,263.

Int. Cl.[7] **H04B** *3/46*

U.S. Cl. 375—224 **4 Claims**



SSB FTD Test Diagram

1. A system for determining the transmission response of a device under test (DUT), the DUT is a frequency translation device (FTD), the system comprising steps of,

measuring a first frequency response of the DUT coupled through a filter with a first test device (TD**1**), the TD**1** is an FTD, one of the coupled DUT and TD**1** is an up converter FTD and the other one of the coupled DUT and TD**1** is a down converter FTD, the filter having a filter response,

measuring a second frequency response of the DUT coupled through the filter with a second test device (TD**2**), the TD**2** is an FTD, one of the coupled DUT and TD**2** is an up converter FTD and the other one of the coupled DUT and TD**2** is a down converter FTD,

measuring a third frequency response of the TD**1** coupled through the filter with the TD**2**, one of the coupled TD**1** and TD**2** is an up converter FTD and the other one of the coupled TD**1** and TD**2** is a down converter FTD, one of the TD**1** FTD and TD**2** FTD has a reciprocal up converter and down converter frequency response, the one FTD is an up converter during one of the first, second, or third measurements and is a down converter during another one of the first, second, or third measurements,

removing the filter response from the first, second, and third frequency response, and

calculating the transmission response of the DUT from the first, second, and third frequency responses.

6,041,078
METHOD FOR SIMPLIFYING BIT MATCHED MOTION ESTIMATION

Sailesh Krishna Rao, Colts Neck, N.J., assignor to Level One Communications, Inc., Sacramento, Calif.

Provisional application No. 60/041,535, Mar. 25, 1997. This application Aug. 28, 1997, Appl. No. 924,065.

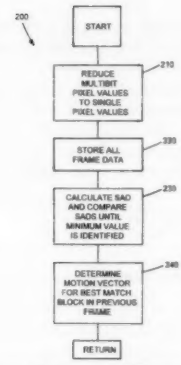
Int. Cl.[7] **H04N** *7/36*

U.S. Cl. 375—240 **11 Claims**

1. A method for performing motion estimation, comprising:

converting multibit pixel values of frames to single bit pixel values;

storing a previous frame of single bit pixel values and a reference frame of single bit pixel values;



comparing a sum-of-absolute differences of pixel values between the reference frame and a block in a search area within the previous frame to find a best match block in the previous frame;

calculating a motion vector representing the difference between the reference block and the best matched block in the previous frame; and

wherein the step of converting multibit pixel values of frames to single bit pixel values further comprises the step of thresholding the value of a reference pixel with respect to a low-pass filtered average value around the reference pixel, and the value of the reference pixel is substituted by the average value of the neighboring pixels.

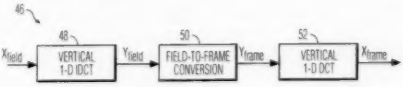
6,041,079
FIELD/FRAME CONVERSION OF DCT DOMAIN MIXED FIELD/FRAME MODE MACROBLOCKS USING 1-DIMENSIONAL DCT/IDCT

Changhoon Yim, Edison, N.J., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Jun. 30, 1998, Appl. No. 108,005

Int. Cl.[7] **H04N** *7/30*

U.S. Cl. 375—240 **2 Claims**



1. A method of performing field/frame conversion of DCT domain mixed field/frame mode macroblocks comprising the steps of:

a) performing a vertical 1-D IDCT on the DCT domain mixed field/frame mode macroblock according to a first relationship $Y=S^{-1}X=S'X$ to obtain a horizontal 1-D DCT domain macroblock;

b) performing field/frame conversion on said horizontal 1-D DCT domain macroblock utilizing a second relationship $Y_{frame}(2\ m,n)=Y_{field}(m,n)$, with $0 \leqq m \leqq 7$, and a third relationship $Y_{frame}(2\ m+1,n)=Y_{field}(m+8,n)$, with $0 \leqq m \leqq 7$; and

c) performing a vertical 1-D DCT on the field/frame converted horizontal 1-D DCT domain macroblock according to a fourth relationship $X=SY$ to obtain a 2-D DCT domain macroblock.

6,041,080

SIGNAL PROCESSING SYSTEM AND METHOD FOR DIGITALLY MIXING A PLURALITY OF ANALOG INPUT SIGNALS

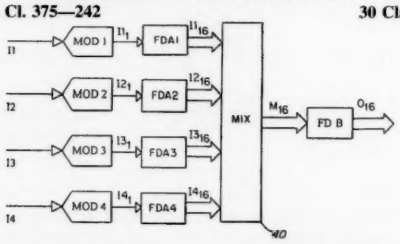
Christian Fraisse, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Dec. 26, 1996, Appl. No. 773,170

Claims priority, application France, Dec. 29, 1995, 95 15861

Int. Cl.[7] **H04B** *14/04;14/06;* **H03M** *1/00;3/00*

U.S. Cl. 375—242 **30 Claims**



9. A method of signal processing, comprising the steps of:

(A) modulating at least two analog signals to produce a high frequency oversampled digital signal for each of the at least two analog signals;

(B) digitally filtering using a first decimation filter each high frequency oversampled digital signal, to produce intermediate frequency oversampled multiple bit signals;

(C) digitally mixing the intermediate frequency oversampled signals to produce a mixed signal at an intermediate frequency; and

(D) digitally filtering using a second decimation filter the mixed signal, to produce a final digital output signal, at a frequency suitable for representing the at least two analog signals.

6,041,081

CDMA TRANSMITTER HAVING A VARIABLE GAIN CIRCUIT INSERTED BETWEEN A TRANSMITTER MIXER AND A TRANSMITTER ANTENNA

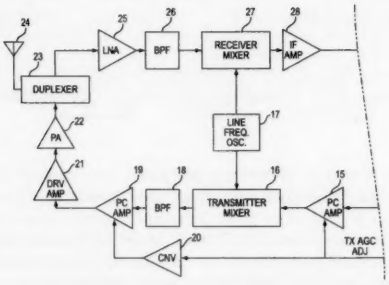
Waho O, and Tsutomu Katsuyama, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1997, Appl. No. 820,994

Claims priority, application Japan, Mar. 26, 1996, 8-069900

Int. Cl.[7] **H04L** *25/03*

U.S. Cl. 375—297 **11 Claims**



1. A CDMA (code division multiple access) transmitter for transmitting a first signal at an RF (radio frequency) frequency under first limitations on a spurious emission level at a first RF output power and second limitations on a spurious emission level at a second RF output power smaller than the first RF output power by a predetermined amount, the first RF output power being a maximum RF output power of said transmitter, the second limitations being severer than the first limitations, said CDMA transmitter comprising:

a transmitter mixer for mixing a second signal to be transmitted with a local oscillation signal to produce the first signal at the RF frequency;

a transmitter antenna for radiating the first signal at the RF frequency;

a power control circuit having a variable first gain responsive to a power control signal for supplying said transmitter antenna with the first signal produced from said transmitter mixer and the first gain, the power control signal corresponding to an RF power level at which the first signal is to be radiated by said transmitter antenna; and

a power control amplifier connected to an input side of said transmitter mixer and having a variable second gain responsive to the power control signal for amplifying the second signal with the second gain to provide said transmitter mixer with the amplified second signal;

said power control circuit varying the first gain in response to the power control signal so as to maximize the first gain based upon the power control signal.

6,041,082

DIGITAL AMPLITUDE MODULATION AMPLIFIER AND TELEVISION BROADCASTING MACHINE

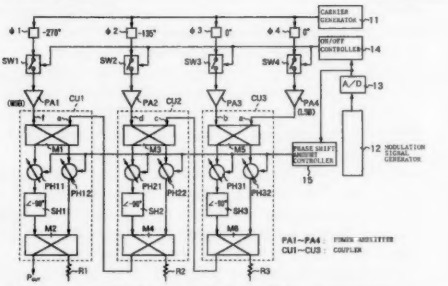
Haruo Takeda; Yukio Tatsumi; Ikuji Fujitani; Takuya Shioda; Tomofumi Yoshimi; Tomohiko Sugimoto, and Kazuhisa Haeiwa, all of Tokyo, Japan, assignors to NEC Corporation, and Nippon Hoso Kyokai, both of Japan

Filed Sep. 4, 1997, Appl. No. 923,323

Claims priority, application Japan, Sep. 6, 1996, 8-257666; Sep. 6, 1996, 8-257667

Int. Cl.[7] **H03C** *1/52*

U.S. Cl. 375—300 **15 Claims**



1. A digital amplitude modulation amplifier, comprising:

an A/D converter for converting an analog modulation signal into a digital signal of a predetermined quantization bit number;

a plural number of power amplifiers equal to the quantization bit number of the digital signal for C class operating with amplification degrees weighted for the individual bits;

selectively inputting means for selectively inputting a carrier to said plural number of power amplifiers in accordance with values of the individual bits of the digital signal;

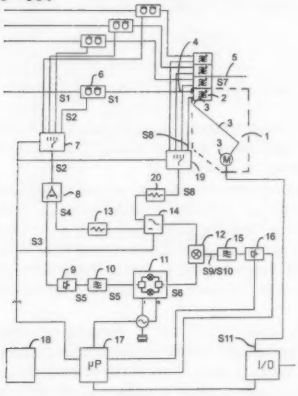
coupling means for power composing, for all bits, output signals of those of said plural number of power amplifiers which are allocated to lower bits and output signals of those of said plural number of power amplifiers which are allocated to the other upper bits while controlling the phases of both of the output signals based on an external input phase control signal, further power composing, for all of the bits, the power composed signals while controlling the phases of the power composed signals based on the output signals of those of said power amplifiers which are allocated to the upper bits and the external input phase control signal and outputting an amplitude modulated wave from the last stage; and

phase controlling means for receiving the digital signal as an input signal and generating and supplying the external input phase control signal to said coupling means.

6,041,083
METHOD AND SYSTEM FOR TUNING RESONANCE MODULES

Lennart Larsson, Akersberga, and Rolf Folkesson, Brottby, both of Sweden, assignors to Allgon Ab, Akersberga, Sweden

Filed Jul. 9, 1997, Appl. No. 890,215
Claims priority, application Sweden, Jul. 10, 1996, 9602740
Int. Cl.[7] H03K *7/06*
U.S. Cl. 375—304 **8 Claims**



1. A method for tuning at least one tunable resonance module in a radio base station, said resonance module having tuning means, a transmitter connection, and an antenna connection, said method comprising the steps of:

(a) mixing an input signal, originating from a transmitter signal present on the transmitter connection, with a low-frequency signal so as to generate a single side band signal,

(b) mixing with the single side band signal an output signal being offset in phase from the input signal by a relative first phase difference dependent on a present tuning of the resonance module, said output signal being one in a group consisting of: a signal originating from an antenna signal present on the antenna connection, and a signal probed within the resonance module,

(c) mixing the single side band signal with a signal originating from the transmitter signal on the transmitter connection,

(d) comparing, at a frequency range about that of the low-frequency signal, mixing products resulting from steps (b) and (c), respectively, so as to determine a relative second phase difference between the input and output signals, and

(e) operating, based on said second phase difference, the tuning means to tune the resonance module to a frequency of the transmitter signal present on the transmitter connection, so as to adjust said second phase difference to a predetermined value.

6,041,084
CIRCUIT FOR OPTIMAL SIGNAL SLICING IN A BINARY RECEIVER

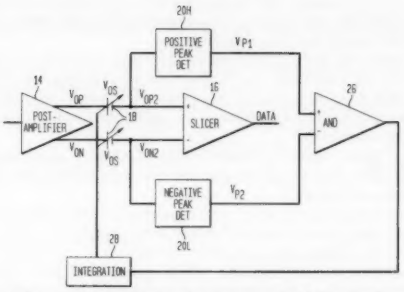
Krishnaswamy Nagaraj, Somerville, N.J., assignor to Lucent Technologies, Inc., Holmdel, N.J.

Filed Aug. 15, 1997, Appl. No. 911,231
Int. Cl.[7] H04L *25/06*
U.S. Cl. 375—317 **9 Claims**

1. A circuit for amplitude slicing an electrical voltage signal to obtain binary type information comprising:

a slicer to receive said voltage signal and to slice said signal to generate a binary signal related to a midpoint of the voltage signal applied to said slicer, said midpoint being at a predetermined voltage level;

first and second peak detectors to receive said voltage signal and produce a respective output related to the positive and negative peaks of said voltage signal;



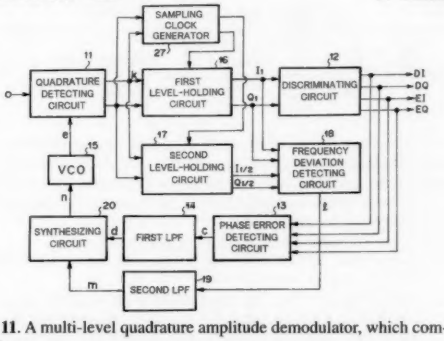
an offset circuit to receive the outputs of said first and second peak detectors and to produce an offset voltage from a differential of said outputs of said first and second peak detectors; and

a combiner circuit which combines said voltage signal with said offset voltage to maintain the midpoint of the amplitude of said voltage signal received by said slicer at said predetermined voltage level.

6,041,085
CARRIER REGENERATING CIRCUIT, MULTI-LEVEL QUADRATURE AMPLITUDE DEMODULATOR, AND METHOD OF DETECTING FREQUENCY DEVIATION

Makoto Anzai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 4, 1997, Appl. No. 963,620
Claims priority, application Japan, Nov. 22, 1996, 8-312149
Int. Cl.[7] H04L *27/14;27/06*
U.S. Cl. 375—326 **17 Claims**



11. A multi-level quadrature amplitude demodulator, which comprises:

quadrature detecting means which demodulates a multi-level quadrature amplitude modulated signal using a regenerated carrier to generate an in-phase component and a quadrature component,

first level-holding means which samples and holds said in-phase component and said quadrature component at an aperture of eye patterns of said in-phase component and said quadrature component to generate and output a current in-phase component and a current quadrature component,

second level-holding means which samples and holds said in-phase component and said quadrature component at a middle point of said aperture to generate and output a half-delayed in-phase component and a half-delayed quadrature component,

sampling clock generating means which generates sampling clocks of said first level-holding means and said second level-holding means,

discriminating means which discriminates said current in-phase component and said quadrature component to generate two main signals and two error signals,

frequency deviation calculating means which calculates a semi frequency deviation signal based on said current in-phase component, said current quadrature component, said half-delayed in-phase component, and said half-delayed quadrature component,

phase error calculating means which calculates a phase error signal by logically processing said two main signals and said two error signals,

synthesizing means which synthesizes said semi frequency deviation signal and said phase error signal to generates control voltage, and

a voltage controlled oscillator which outputs said regenerated carrier having a frequency which is controlled by said control voltage.

6,041,086

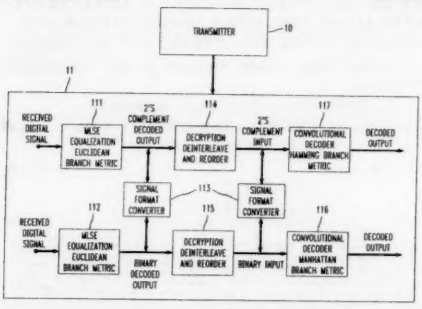
SIGNAL DECODING FOR EITHER MANHATTAN OR HAMMING METRIC BASED VITERBI DECODERS

Thomas W. Baker, North Whitehall Township, Pa., and Mohammed S. Mobin, Old Bridge, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.Y.

Filed Apr. 4, 1996, Appl. No. 628,073

Int. Cl.[7] H04L *27/06*

U.S. Cl. 375—341 **24 Claims**



18. Apparatus for decoding a digital signal carrying predetermined information represented in one of several different number systems with a decoder that decodes said digital signal based on a metric scheme requiring said digital signal to be represented in a first number system, comprising:

a receiver for receiving said digital signal;

a signal format converter for converting said digital signal to said first number system; and

a decoder for decoding the predetermined information represented by said digital signal that has been converted into said first number system in a single pass through said decoder to provide the decoded predetermined information.

6,041,087

INFORMATION RECEIVING SYSTEM AND AN INFORMATION RECEIVING METHOD USING SUCH A SYSTEM

Nobuya Inamori, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Sep. 9, 1997, Appl. No. 925,802

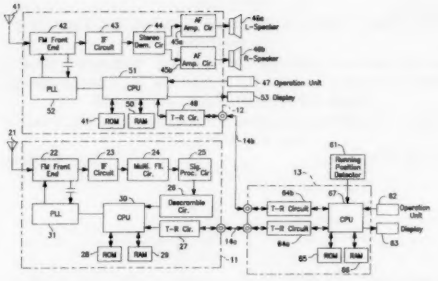
Claims priority, application Japan, Sep. 13, 1996, 8-243166

Int. Cl.[7] H03D *1/06*

U.S. Cl. 375—348 **3 Claims**

1. An information receiving system, comprising:

a first information receiver, the first information receiver being an FM multiplex receiver for receiving a first information radio wave, the first information radio wave being an FM multiplex broadcast radio wave including traffic information, the first information receiver having first tuning means for setting tuning frequencies,



a second information receiver, the second information receiver being a radio for receiving a second information radio wave, the second information radio wave being an FM radio broadcast radio wave, the second information receiver having second tuning means for setting tuning frequencies, and

a control unit for controlling the first and second information receivers,

wherein the control unit has a function of discriminating whether the second information receiver is on and controlling the first tuning means of the first information receiver for avoiding setting a tuning frequency of the first information receiver to a specified prohibited frequency in the case that the first and second information receivers are simultaneously on.

6,041,088

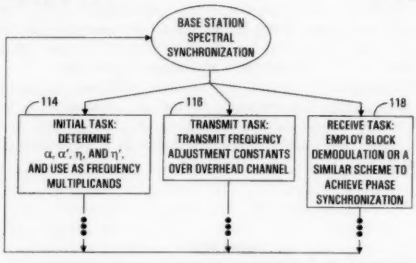
RAPID SYNCHRONIZATION FOR COMMUNICATION SYSTEMS

Ronald D. McCallister, Scottsdale, Ariz., assignor to Sicom, Inc., Scottsdale, Ariz.

Continuation-in-part of application No. 08/740,016, Oct. 23, 1996. This application Jun. 10, 1998, Appl. No. 95,357.

Int. Cl.[7] H04L *7/00*

U.S. Cl. 375—358 **24 Claims**


BASE STATION SPECTRAL SYNCHRONIZATION
114
INITIAL TASK: DETERMINE α, α', η, AND η', AND USE AS FREQUENCY MULTIPLICANDS
116
TRANSMIT TASK: TRANSMIT FREQUENCY ADJUSTMENT CONSTANTS OVER OVERHEAD CHANNEL
118
RECEIVE TASK: EMPLOY BLOCK DEMODULATION OR A SIMILAR SCHEME TO ACHIEVE PHASE SYNCHRONIZATION

1. A method for rapid frequency synchronization of a reverse channel signal to a base station receiving frequency which is proportional to η times a base station reference frequency, where η is a first value, said method comprising the steps of:

transmitting a forward channel signal from a base station, said forward channel signal exhibiting a base station transmitting frequency which is proportional to α times said base station reference frequency, where α is a second value;

calculating, at said subscriber unit, a frequency multiplicand which is proportional to η and inversely proportional to α;

generating a subscriber unit transmitting frequency in response to said frequency multiplicand; and

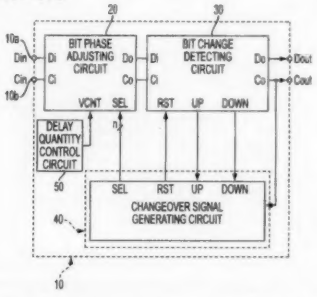
transmitting said reverse channel signal from said subscriber unit, said reverse channel signal exhibiting said subscriber unit transmitting frequency.

6,041,089

BIT PHASE SYNCHRONIZING METHOD AND BIT PHASE SYNCHRONIZING CIRCUIT

Koichi Yokomizo, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1997, Appl. No. 788,862
Claims priority, application Japan, Jul. 10, 1996, 8-180928
Int. Cl.[7] H04L *7/02*
U.S. Cl. 375—371 **16 Claims**



1. A method for attaining bit phase synchronization, comprising the steps of:

generating a control voltage with a control voltage generating circuit that includes a voltage control oscillator, said voltage control oscillator receiving said control voltage,

inputting input data into a first delay gate group composed of plural delay gates which are connected in series to one another and which have signal delay quantities, each of the delay gates including a transistor and an inverter connected in series with the transistor between a power source and ground, the transistor having a gate which receives said control voltage,

selecting either said input data or delayed data related to said input data and obtained from one of the delay gates in said first delay gate group and outputting the selected data,

inputting said selected data into a second delay gate group composed of N delay gates (where N is an integer satisfying $N \geqq 2$),

generating a bit change detecting signal for showing whether or not a change in logic level (also called a bit change) of output data from a pth-stage delay gate of said second delay gate group has happened within a specified time before and after a judgement time, by judging at the same time controlled by a reference clock signal whether or not output data of the pth-stage delay gate (where p is an integer satisfying $1 \leqq p \leqq N$) of said second delay gate group and output data of at least the (p−1)th-stage delay gate (where in case of p=1, the (p−1)th-stage delay gate is considered to be the input point of the second delay gate group) coincide in logic level with each other, and whether or not output data of said pth-stage delay gate and output data of at least the (p+1)th-stage delay gate coincide in logic level with each other,

synchronizing said input data in phase with said reference clock signal by changing the selected data that is currently being outputted to another selected data according to said bit change detecting signal, and outputting the changed selected data, and

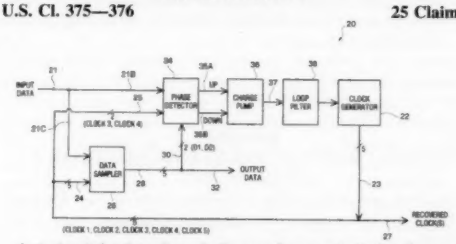
controlling the delay gates of said first delay gate group so as to compensate for variations in the signal delay quantities of these delay gates, by varying said control voltage received by the gates of the transistors within a predetermined range to thereby vary the current available to the inverters, the predetermined range being such that the transistors do not come to be off.

6,041,090

DATA SAMPLING AND RECOVER IN A PHASE-LOCKED LOOP (PLL)

Dao-Long Chen, Fort Collins, Colo., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of application No. 08/513,055, Aug. 9, 1995, abandoned. This application Nov. 14, 1997, Appl. No. 962,890.
Int. Cl.[7] H03D *3/24*
U.S. Cl. 375—376 **25 Claims**



1. A circuit for detecting whether a reference clock signal, one of n phase-shifted adjacent clock signals, of a phase-locked loop (PLL) is aligned with incoming data, comprising:

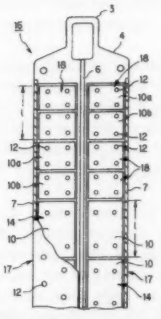
a data sampler for sampling bits of the incoming data with each of the adjacent clock signals, wherein a first of the adjacent clock signals clocks said bits **0**, **0**+*n*, **0**+**2***n*, . . . , and a second of the adjacent clock signals clocks said bits **1**, **1**+*n*, **1**+**2***n*, . . . , where n is an odd integer.

6,041,091

CONTROL ROD FOR NUCLEAR REACTOR

Makoto Ueda, Yokohama; Shigenori Shiga, Fujisawa; Satoko Tajima, and Hideki Morishita, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 4, 1997, Appl. No. 906,243
Claims priority, application Japan, Aug. 8, 1996, 8-209925
Int. Cl.[7] G21C *7/00;7/113*
U.S. Cl. 376—327 **3 Claims**



1. A control rod for a nuclear reactor, comprising:

a center structural member; and

a plurality of wings each including

a sheath member of long plate structure having a U-shaped cross section having an opening which is secured to the center structural member,

a front end structural member secured to a front end side of the wing viewed from a wing inserting direction in a reactor core,

a terminal end structural member secured to a terminal end side of the wing viewed from the wing inserting direction in the reactor core,

a plurality of neutron absorbing elements each having a plate structure accommodated in each of said sheaths in a row in a longitudinal direction thereof and each being formed of one or more neutron absorbing plates, and

a plurality of load supporting members for supporting weights of the neutron absorbing elements,

wherein respective lengths in the sheath longitudinal direction of the neutron absorbing elements closer to the front end structural member are smaller than respective lengths in the sheath longitudinal direction of the neutron absorber elements further from the front end structural member, and the neutron absorbing elements are supported to the U-shaped sheath by the load supporting members to thereby reduce a local load applied to the U-shaped sheath.

6,041,092

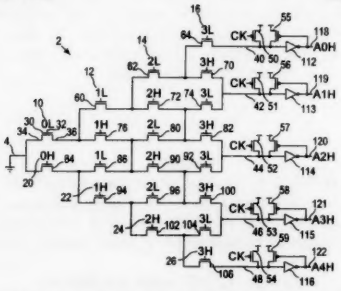
DIGITAL CIRCUIT TO COUNT LIKE SIGNALS IN A DATA WORD

Li C. Tsai, and Richard M. Blumberg, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 30, 1998, Appl. No. 183,311

Int. Cl.[7] G06M *3/00*

U.S. Cl. 377—1 **23 Claims**



1. A method of manufacturing a device for counting a number of like signals in a plurality of data bits, comprising:

a) providing a first plurality of signal paths comprising a true signal path and a complementary signal path for each of N data bits;

b) providing a first plurality of transfer gates, each of the first plurality of transfer gates comprising two terminals and a control input, whereby application of a signal to the control input of a given one of the first plurality of transfer gates enables opening and closing of a connection between the two terminals of the given one of the first plurality of transfer gates;

c) interconnecting a first signal source to a first plurality of one-hot outputs via the first plurality of transfer gates by forming a first plurality of series paths between the first signal source and the first plurality of one-hot outputs, each of the first plurality of series paths comprising a subset of the first plurality of transfer gates which are connected via their terminals; and

d) connecting ones of the first plurality of signal paths to ones of the control inputs of the first plurality of transfer gates by:

i) connecting a different one of the first plurality of signal paths to the control input of each transfer gate forming a given one of the first plurality of series paths;

ii) connecting a different subset of the first plurality of signal paths to the control inputs of transfer gates in each series path of the first plurality of series paths; and

iii) connecting a same ratio of true signal paths for the N data bits to complementary signal paths for the N data bits to the control inputs of transfer gates in each series path of the first plurality of series paths which interconnects the first signal source to a given one of the first plurality of one-hot outputs.

6,041,093

VARIABLE FREQUENCY DIVIDING CIRCUIT

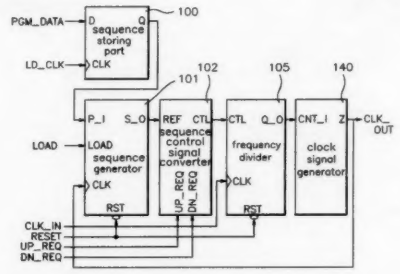
Sung Ky Cho, Kyungki-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-Do, Rep. of Korea

Filed Aug. 21, 1998, Appl. No. 138,071

Claims priority, application Rep. of Korea, Aug. 22, 1997, 97-40189

Int. Cl.[7] H03K *21/00*

U.S. Cl. 377—47 **22 Claims**



1. A variable frequency dividing circuit comprising:

a sequence storing part for storing a predefined N-bit sequence data to output said N bits of said sequence data in parallel;

a sequence generator for receiving said N-bit sequence data from said sequence storing part to generate a sequence control signal;

a sequence control signal converter for receiving said sequence control signal according to a frequency variation request to generate a converted sequence control signal;

a frequency divider for dividing a clock signal frequency according to said converted sequence control signal outputted from said sequence control signal converter; and

a clock signal generator for producing a clock waveform in accordance with said divided clock signal frequency.

6,041,094

INTERMEDIATE DENSITY MARKER AND A METHOD USING SUCH A MARKER FOR RADIOGRAPHIC EXAMINATION

Donald G. Russell, 86 Windsor Rd., Kensington, Conn. 06037

Continuation of application No. 08/372,658, Jan. 13, 1995, which is a continuation-in-part of application No. 08/059,201, May 7, 1993, Pat. No. 5,383,233. This application Sep. 19, 1997, Appl. No. 934,121.

Int. Cl.[7] A61B *6/04*

U.S. Cl. 378—37 **13 Claims**

1. A method of mammography examination comprising the steps of:

providing a source of xray radiation capable of generating radiation suitable for imaging breast tissue;

selecting a partially radiolucent, partially radiopaque marker having a radiographic density and thickness which permit the marker to both project a radiographic shadow and transmit sufficient radiation to image anatomical detail present in the breast tissue when the marker and the breast tissue are exposed to the xray radiation during mammographic examination, wherein the marker is constructed of aluminum having a thickness of about 0.011 to about 0.022 inches and wherein the marker absorbs from about 2% to about 75% of the incident radiation;

positioning the marker between the source of xray radiation and the breast tissue; and

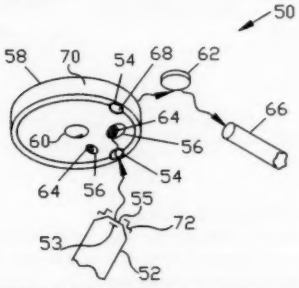
exposing the marker and the breast tissue to the xray radiation to generate a radiographic image of the breast tissue having the shadow of the marker superimposed thereon, wherein anatomical detail present in the breast tissue is clearly visible through the radiographic shadow projected by the marker.

6,041,095

X-RAY FLUORESCENCE ANALYZER

Boris Yokhin, Nazareth Illit, Israel, assignor to Jordan Valley Applied Radiation, Migdal Haemek, Israel

Filed Feb. 24, 1998, Appl. No. 28,588
Claims priority, application Israel, Mar. 12, 1997, 120429
Int. Cl.[7] G01N *23/223*
U.S. Cl. 378—45 **20 Claims**



1. Apparatus for X-ray excitation of a sample, comprising:

a substantially stationary X-ray source; and

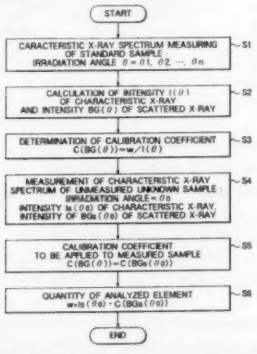
X-ray optics, comprising at least one secondary target and a movable element having at least a first position wherein X-rays emitted by the source excite the sample directly, and a second position wherein X-rays emitted by the source strike the at least one secondary target, causing the secondary target to emit X-rays that excite the sample, while the X-rays emitted by the source are substantially prevented from exciting the sample.

6,041,096

METHOD AND APPARATUS FOR TOTAL REFLECTION X-RAY FLUORESCENCE SPECTROSCOPY

Ichiro Doi, and Shoichiro Tonomura, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP96/02185, § 371 Date Feb. 6, 1998, § 102(e) Date Feb. 6, 1998, PCT Pub. No. WO97/06430, PCT Pub. Date Feb. 20, 1997
PCT Filed Aug. 2, 1996, Appl. No. 11,046
Claims priority, application Japan, Aug. 9, 1995, 7-203393
Int. Cl.[7] G01N *23/223*
U.S. Cl. 378—48 **4 Claims**


START
CARACTERISTIC X-RAY SPECTRUM MEASURING OF STANDARD SAMPLE IRRADIATION ANGLE θ = θ1, θ2, ···, θn
S1
CALCULATION OF INTENSITY I(θ) OF CHARACTERISTIC X-RAY AND INTENSITY BG(θ) OF SCATTERED X-RAY
S2
DETERMINATION OF CALIBRATION COEFFICIENT C(BG(θ))=w/I(θ)
S3
MEASUREMENT OF CHARACTERISTIC X-RAY SPECTRUM OF UNMEASURED UNKNOWN SAMPLE : IRRADIATION ANGLE= θα INTENSITY Is(θα) OF CHARACTERISTIC X-RAY, INTENSITY OF BGs(θα) OF SCATTERED X-RAY
S4
CALIBRATION COEFFICIENT TO BE APPLIED TO MEASURED SAMPLE C(BG(θ))=C(BGα(θα))
S5
QUANTITY OF ANALYZED ELEMENT w=Is(θα)·C(BGs(θα))
S6
END

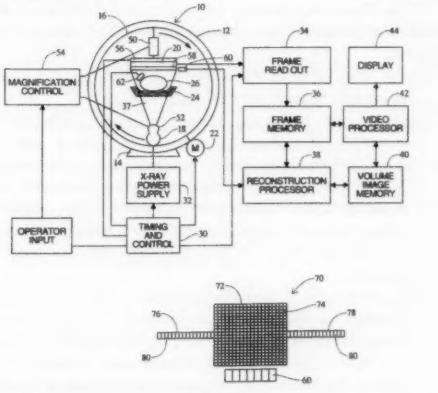
1. An apparatus for total reflection X-ray fluorescence spectroscopy of irradiating primary X-rays to a measured sample at an angle near a critical total reflection angle, and measuring a characteristic X-ray spectrum emitted from the measured sample by the primary X-rays thereby analyzing an analyzed element on the measured sample, wherein the apparatus comprises an X-ray intensity measuring means for irradiating primary X-rays previously on a standard sample having substantially the same composition as that of a measured sample having a smooth surface at a plurality of irradiation angles near a total reflection angle, means for determining a characteristic X-ray intensity for an analyzed element and a scattered X-ray intensity at a wavelength of the characteristic X-rays for the analyzed element, a function memory means for determining a calibration coefficient indicative of a relation between the characteristic X-ray intensity determined by the X-ray intensity measuring means for the standard sample and a known quantity of the analyzed element on the basis of both of them as a function of the scattered X-ray intensity and storing the function, an X-ray intensity measuring means for measuring a characteristic X-ray spectrum when the primary X-rays are irradiated to the measured sample at an angle smaller than a critical total reflection angle and determining a characteristic X-ray intensity for the analyzed element appearing in the characteristic X-ray spectrum and a scattered X-ray intensity at a wavelength of the characteristic X-rays for the analyzed element, a calibration coefficient calculation means for determining a calibration coefficient by substituting the scattered X-ray intensity determined by the X-ray intensity measuring means for the measured sample as a scattered X-ray intensity of the function stored in the function memory means, and a calculation means for calibrating the characteristic X-ray intensity for the analyzed element determined by the calibration coefficient calculation means and calculating the quantity of the analyzed element.

6,041,097

METHOD AND APPARATUS FOR ACQUIRING VOLUMETRIC IMAGE DATA USING FLAT PANEL MATRIX IMAGE RECEPTOR

Pieter Gerhard Roos, Bainbridge; Andrew J. Ivan, Aurora, and Rodney A. Mattson, Mentor, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Apr. 6, 1998, Appl. No. 55,607
Int. Cl.[7] G01N *23/04;* **A61B** *6/03*
U.S. Cl. 378—62 **27 Claims**



1. A diagnostic imaging apparatus comprising:

a gantry which supports an x-ray tube and a flat plate x-ray detector for rotation about an examination region with the x-ray tube and the flat plate detector disposed across the examination region from each other;

a motor assembly for selectively rotating the x-ray tube and the flat plate detector around the examination region;

a read out device for reading out a two dimensional array of data values from the flat plate detector, each data value being indicative of radiation attenuation along one of a plurality of diverging rays extending between the x-ray source and a sub-region of the flat plate detector;

a reconstruction processor for reconstructing the data values read out during rotation of the x-ray tube and the flat plate detector around the examination region into a volumetric image representation;

a video processor for (i) formatting the read out data values into appropriate format for display on a video monitor as a projection image and (ii) reformatting selective portions of volumetric image data into appropriate format for display on the monitor; and

an optical reset device for saturating the flat plate x-ray detector after data values have been read out of the flat plate x-ray detector by the read out device.

6,041,098

X-RAY REFLECTOMETER

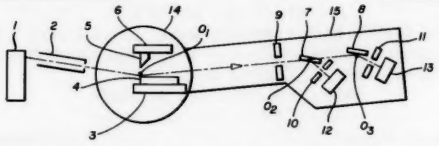
Alexander G. Touryanski; Alexander V. Vinogradov, and Igor V. Pirshin, all of X-Ray Optics Group, P.N. Lebedev Physical Institute, Leninsky Prospekt, 53, Moscow, Russian Federation, 117924

Filed Feb. 2, 1998, Appl. No. 20,583

Claims priority, application Russian Federation, Feb. 3, 1997, 971016153

Int. Cl.[7] G01N *23/20*

U.S. Cl. 378—70 **13 Claims**



1. An X-ray reflectometer for analyzing characteristics of a material utilizing reflected radiation, the X-ray reflectometer comprising:

(A) an X-ray radiation source, the source being adapted to emit an incident beam of polychromatic radiation;

(B) a base, the base being adapted to support a material, the material being supported in the incident beam of polychromatic radiation, wherein the material reflects the incident beam of polychromatic radiation producing a reflected beam of polychromatic radiation, the base further being adapted to rotate, wherein the angular position of the material relative to the incident beam of polychromatic radiation may be adjusted;

(C) a support, the support being adapted to rotate relative to the material, wherein devices attached to the support may be positioned in the reflected beam of polychromatic radiation;

(D) at least a first and second monochromator attached to the support, the first and second monochromators being positionable in the reflected beam of polychromatic radiation, the first and second monochromators being adapted to produce a monochromatic beam of radiation when positioned in a polychromatic beam of radiation; and

(E) at least a first and second detector attached to the support, the first detector being positionable in the beam of monochromatic radiation produced by the first monochromators, the second detector being positionable in the beam of monochromatic radiation produced by the second monochromator, the first and second detectors being adapted to detect monochromatic radiation.

6,041,099

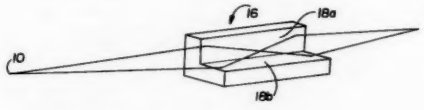
SINGLE CORNER KIRKPATRICK-BAEZ BEAM CONDITIONING OPTIC ASSEMBLY

George Gutman, Birmingham; Licai Jiang, and Boris Verman, both of Troy, all of Mich., assignors to Osmic, Inc., Troy, Mich.

Filed Feb. 19, 1998, Appl. No. 26,385

Int. Cl.[7] G21K *1/06*

U.S. Cl. 378—85 **20 Claims**



1. An x-ray directing system comprising:

a Kirkpatrick-Baez side-by-side optic which redirects x-rays, wherein said Kirkpatrick-Baez side-by-side optic has multilayer Bragg x-ray reflective surfaces.

6,041,100

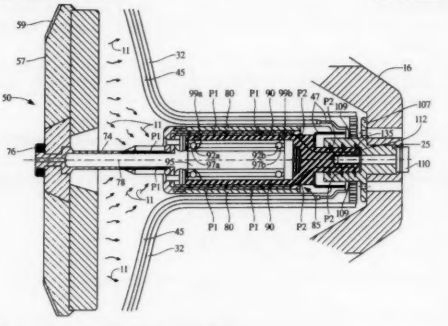
COOLING DEVICE FOR X-RAY TUBE BEARING ASSEMBLY

Lester D. Miller, Hudson, Ohio; Mark S. Maska, Palatine, and Andrew R. Kaczmarek, Jr., Compton, both of Ill., assignors to Picker International, Inc., Cleveland, Ohio

Filed Apr. 21, 1998, Appl. No. 63,073

Int. Cl.[7] H01J *35/10*

U.S. Cl. 378—141 **24 Claims**



1. An x-ray apparatus comprising:

a housing filled with a cooling medium;

an x-ray tube disposed within the housing and surrounded by the cooling medium, the x-ray tube including:

an envelope defining an evacuated chamber;

a cathode assembly disposed in the envelope, said cathode assembly including a filament which emits electrons when heated;

an anode assembly disposed in the envelope, the anode assembly defining a target for intercepting the electrons such that collision between the electrons and the anode assembly generate x-rays from an anode focal spot; and

a bearing assembly rotatably supporting the anode assembly; and

means for providing a direct thermal connection between the bearing assembly and the cooling medium.

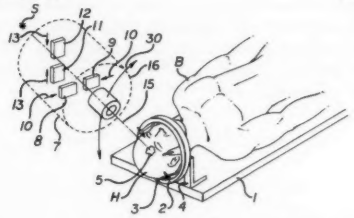
6,041,101
JAW AND CIRCULAR COLLIMATOR

Hanne M. Kooy, Newton; Fred L. Hacker, Brookline, and Marc R. Bellerive, Boston, all of Mass., assignors to Radionics, Inc., Burlington, Mass.

Continuation of application No. 08/736,792, Oct. 25, 1996. This application Aug. 17, 1998, Appl. No. 135,199. This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G21K** *1/02*

U.S. Cl. 378—147 **4 Claims**



1. A collimator system for a treatment planning machine which delivers a beam comprising:

a. a circular collimator which defines a circular aperture for said beam, said circular aperture being positionally fixed with respect to said beam; and

b. at least one collimator jaw that can be moved into the projection of said circular aperture with respect to said beam so as to eclipse a portion of said beam before it enters said circular aperture;

whereby the combined beam aperture of said circular collimator and said collimator jaw deviates from a circular aperture by the degree that said collimator jaw intersects said projection of said circular aperture with respect to said beam; and

c. a conformal treatment planning system in cooperation with said circular collimator and said at least one collimator jaw to configure said circular collimator and said at least one collimator jaw with respect to a target volume based on input data from a scanner.

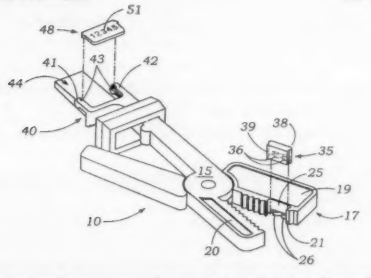
6,041,102
DATA-IMPRINTED DENTAL RADIOGRAPH DEVICE AND PROCESS

Kenneth M. Francsis, 975 E. Nerge Rd., Roselle, Ill. 60172

Filed Apr. 8, 1998, Appl. No. 57,241

Int. Cl.[7] **A61B** *6/14*

U.S. Cl. 378—165 **14 Claims**



1. A device for permanently imprinting dental radiographs with variable, predetermined data comprising:

means for temporarily and re-usably securing radiographic film intra-orally for examination of a tooth or teeth; and

means adjustably and removably associated with the securing means for positioning radio-opaque data-carrying means in proximal relation to said film;

whereby said film is permanently imprinted with said predetermined data.

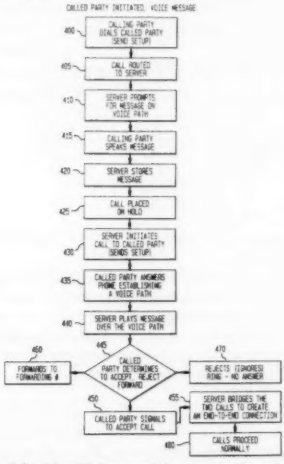
6,041,103
INTERACTIVE CALL IDENTIFICATION

Thomas F. La Porta, New York, N.Y., and Arun N. Netravali, Westfield, N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Apr. 16, 1996, Appl. No. 632,860

Int. Cl.[7] **H04M** *1/64;11/00;3/42*

U.S. Cl. 379—67.1 **48 Claims**



1. A method for identifying a calling party of a telephone call to a called party, the method comprising the steps of:

receiving said telephone call over a first telephone connection from said calling party, said telephone call directed to a telephone number of said called party dialed by said calling party;

determining whether said telephone number is a subscriber's telephone number or whether said calling party has entered an activation code with the dialed telephone number;

prompting said calling party to enter a message in both of the following situations:

a) when the telephone number is a subscriber's telephone number; and

b) when the calling party has entered an activation code with the dialed telephone number;

receiving said message over said first telephone connection from said calling party, said message containing user-user information, including an identification of said calling party;

establishing a second telephone connection to a called party in response to receiving said message;

sending said message over said second telephone connection to said called party;

receiving a call processing input over said second telephone connection from said called party; and

bridging said first telephone connection to said second telephone connection thereby establishing an end-to-end connection from said calling party to said called party, if said call processing input represents an instruction to accept the call.

6,041,104
METHOD AND SYSTEM FOR ORDERING A TELECOMMUNICATION SERVICE

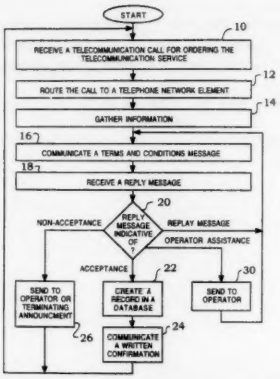
Marc Ira Lipton, Lincolnshire, and Gregory John Dunny, St. Charles, both of Ill., assignors to Ameritech Corporation, Hoffman Estates, Ill.

Filed Oct. 1, 1997, Appl. No. 942,342

Int. Cl.[7] **H04M** *1/64;11/00*

U.S. Cl. 379—67.1 **17 Claims**

1. A method of providing a session for ordering a telecommunication service, the method comprising the steps of:



receiving a telecommunication call for ordering the telecommunication service;

communicating a prerecorded terms and conditions contract message for the telecommunication service to an individual ordering the telecommunication service, the prerecorded terms and conditions contract message communicated to the individual during the telecommunication call and after the individual has indicated the telecommunication service being ordered;

receiving a reply message to the terms and conditions contract message from the individual, the reply message received during the telecommunication call, the reply message including a spoken message indicative of acceptance of the terms and conditions contract; and

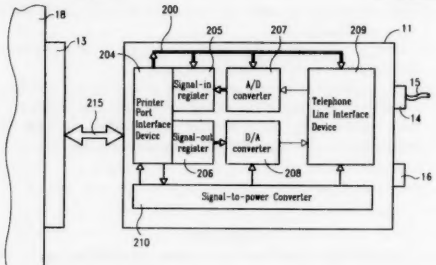
creating and maintaining a record of the session in a database, the record including a recorded audio representation of at least a portion of the telecommunication call which documents that the individual has affirmatively accepted the terms and conditions contract.

6,041,105

ADAPTER CIRCUITRY FOR COMPUTERS TO SUPPORT COMPUTER TELEPHONY

Chung-Yu Wu, Hsinchu, and Ching-Piao Su, Taipei, both of Taiwan, assignors to Umax Data Systems Inc., Hsinchu, Taiwan

Filed Sep. 1, 1998, Appl. No. 144,438
Int. Cl.[7] H04M *11/00*
U.S. Cl. 379—93.05 **17 Claims**



1. An external adapter circuitry for communicating a host computer with a telephone line, comprising:

telephone line interfacing means for receiving a signal-in from a telephone line and transmitting a signal-out to said telephone line;

A/D converting means for receiving said signal-in and outputting a digitized signal-in;

first storing means for latching said digitized signal-in;

printer port interfacing means for transmitting said digitized signal-in to said host computer and receiving a digitized signal-out from said host computer in response to a control signal;

second storing means for latching said digitized signal-out from said printer port interfacing means;

D/A converting means for inputting said digitized signal-out and outputting an analog signal-out; and

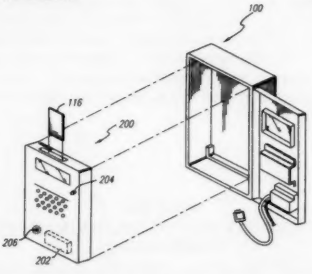
signal-to-power converting means for providing a high voltage converted from high voltage signals from a printer port of said host computer to said telephone line interfacing means, said A/D converting means, said first storing means, said printer port interfacing means, said second storing means, and said D/A converting means.

6,041,106

ACCESS CONTROL APPARATUS FOR USE WITH BUILDINGS, GATED PROPERTIES AND THE LIKE

Alex Parsadayan, and Walter Parsadayan, both of Laguna Niguel, Calif., assignors to Elite Entry Phone Corp., Lake Forest, Calif.

Continuation-in-part of application No. 08/681,615, Jul. 29, 1996. This application Jan. 15, 1997, Appl. No. 783,566.
Int. Cl.[7] H04M *11/00*
U.S. Cl. 379—102.06 **31 Claims**



25. A method of operating an access system, comprising the steps of:

providing an access control apparatus including a housing having a plurality of keys, an electronic communication device within the housing operably connected to a telephone system and to the outer keys, a microphone operably connected to the communication device, and a speaker operably connected to the communication device;

providing at least one peripheral device associated with a lockable entrance;

operably connecting the access control apparatus to the peripheral device;

operably connecting the access control apparatus to a telephone system;

establishing contact with the peripheral device from a remote location by way of the access control device; and

performing a service operation concerning the peripheral device from the remote location with the access control device;

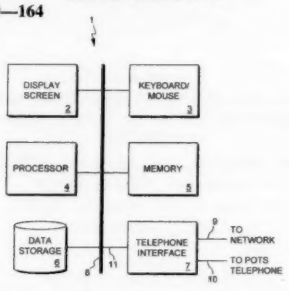
wherein the step of performing a service operation concerning the peripheral device comprises receiving information transmitted by the peripheral device concerning the status of the peripheral device at the remote location by way of the access control apparatus.

6,041,107

TELEPHONE EXTENSION SWITCH HOOK STATE DETECTION SYSTEM

Eric A. Jones, Glendale, and Greig R. Detering, Phoenix, both of Ariz., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Apr. 30, 1998, Appl. No. 70,058
Int. Cl.[7] H04M *1/00*
U.S. Cl. 379—164 **11 Claims**



1. In a computer system, a system for detecting an off-hook extension phone for use in a local loop, comprising:

a data access arrangement operated to connect said detecting system to said local loop;

means to generate an analog signal on said local loop;

means to extract said analog generated signal from the local loop signal;

means to measure the amplitude of said extracted signal; and

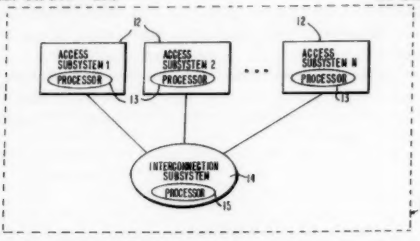
means to compare the amplitude of said extracted signal to a predetermined threshold amplitude value and to signal to said computer system if said amplitude of said extracted signal is less than said threshold amplitude value.

6,041,108

METHOD AND APPARATUS FOR INTELLIGENT NETWORK CALL HANDLING IN A TELEPHONE EXCHANGE

John Brewster, Middletown, and Mehmet Ulema, Redo Bank, both of N.J., assignors to Daewoo Telecom, Ltd., Inchon, Rep. of Korea

Filed Jun. 3, 1997, Appl. No. 868,459
Int. Cl.[7] H04M *3/00*
U.S. Cl. 379—196 **24 Claims**



1. A method for filtering calls in a switch system, the switch system including at least two access subsystems and at least one interconnection subsystem comprising the steps of:

storing a list of active filtering criteria in each of said at least two access subsystems;

receiving an incoming call at at least one access subsystem of said at least two access subsystems;

determining whether the incoming call matches any of the active criteria stored in the at least one access subsystem;

applying a filtering method associated with a matched active filtering criteria if the incoming call matches any one of the active filtering criteria:

determining whether a call should be blocked as a function of said filtering method; and

causing said access subsystem to block the incoming call if it is determined to block the incoming call as a function of the filtering method;

storing a list of active filtering criteria in each of said at least two access subsystems;

storing a filter method associated with each of the active filtering criteria in the interconnection subsystem;

inputting a change to the interconnection subsystem to the list of active filtering criteria and broadcasting the change to each access subsystem; and

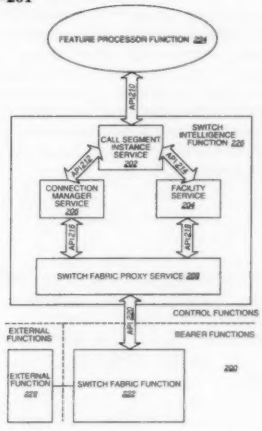
storing the change in the list of active filtering criteria in each of said at least two access subsystems.

6,041,109

TELECOMMUNICATIONS SYSTEM HAVING SEPARATE SWITCH INTELLIGENCE AND SWITCH FABRIC

Douglas Ross Cardy, Plano; Ken Rambo, Dallas, and Carol Waller, Allen, all of Tex., assignors to MCI Communications Corporation, Washington, D.C.

Filed Dec. 29, 1995, Appl. No. 580,712
Int. Cl.[7] H04M *7/00;3/00*
U.S. Cl. 379—201 **8 Claims**



1. An apparatus for decentralizing communication services in a telecommunications system, comprising:

a switch fabric which provides bearer functions;

a switch intelligence which provides control functions for said switch fabric, said switch intelligence logically separated from said switch fabric;

a switch fabric proxy service for providing a normalized interface between said switch fabric and said switch intelligence for all communications involving said switch fabric by interfacing to said switch fabric with any one of a plurality of application program interfaces and interfacing to said switch intelligence with a uniform application program interface; and

feature processor, said feature processor executing at least one telecommunications function, for interacting with said switch intelligence to thereby provide said telecommunications feature.

6,041,110

METHOD AND APPARATUS FOR PROVIDING A TELECOMMUNICATIONS SERVICE

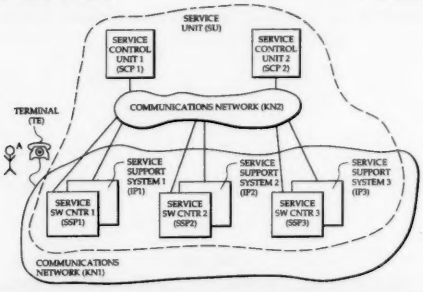
Wolfgang Lautenschlager, Weissach-Flacht, and Uwe Stahl, Leonberg, both of Germany, assignors to Alcatel, Paris, France

Filed Jun. 27, 1997, Appl. No. 883,891

Claims priority, application Germany, Jun. 28, 1996, 196 26 131

Int. Cl.[7] H04M *3/42*

U.S. Cl. 379—201 **18 Claims**


SERVICE UNIT (SU)
SERVICE CONTROL UNIT 1 (SCP 1)
SERVICE CONTROL UNIT 2 (SCP 2)
COMMUNICATIONS NETWORK (KN2)
TERMINAL (TE)
SERVICE SUPPORT SYSTEM 1 (IP1)
SERVICE SUPPORT SYSTEM 2 (IP2)
SERVICE SUPPORT SYSTEM 3 (IP3)
SERVICE SW CNTR 1 (SSP1)
SERVICE SW CNTR 2 (SSP2)
SERVICE SW CNTR 3 (SSP3)
COMMUNICATIONS NETWORK (KN1)

10. A service-providing system (SU) including part of a communications network (**KN1**), comprising at least one service logic (**SL1** to **SL3**) serving to provide a telecommunications service, a receiving unit (**KOM4**) for receiving a service request (**REQ1**) over the communications network (**KN1**) from a terminal (TE) requesting a telecommunications service, and a control unit (**CONTR1**, **CONTR3**) designed to activate the service logic or a service-specific one (**SL1**) of the service logics, characterized in that the service-providing system (SU) further comprises a load unit (LOAD) for loading a service-specific control program (PRO) into the requesting terminal (TE) upon receipt of the service request (**REQ1**), and that the activated service logic (**SL1**) is for cooperating with the service-specific control program (PRO) in the terminal (TE) in providing the telecommunications service, the cooperation in providing the telecommunications service carried out by an exchange of messages between the terminal (TE) and the service-providing system (SU).

6,041,111

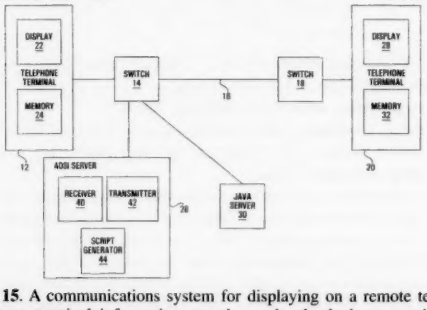
REMOTE TELEPHONE DATA ACCESS AND DISPLAY

Brian R. Shelton, Kanata, Canada, assignor to Nortel Networks Corporation, Montreal, Canada

Filed Dec. 1, 1997, Appl. No. 980,762

Int. Cl.[7] H04M *3/42*

U.S. Cl. 379—201 **16 Claims**



15. A communications system for displaying on a remote telephone terminal information stored at a local telephone terminal comprising:

(a) means for generating a request for information at a remote telephone terminal;

(b) means for transmitting said request to a network element;

(c) means for transmitting a script from said nework element to a local telephone terminal in response to said request;

(d) means for transmitting information from said local telephone terminal to said remote telephone terminal in response to said script; and

(e) means for displaying said information at said remote telephone terminal.

6,041,112

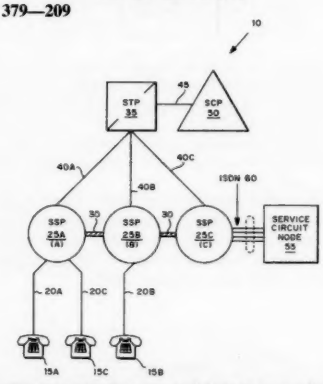
METHOD FOR TRANSFERRING SWITCH-BASED INFORMATION TO AN EXTERNAL NETWORK ELEMENT

Dale W. Malik, Dunwoody, Ga., assignor to BellSouth Intellectual Property Corporation, Wilmington, Del.

Filed Dec. 2, 1997, Appl. No. 982,652

Int. Cl.[7] H04M *3/48*

U.S. Cl. 379—209 **4 Claims**



1. In a telecommunications network including a switch functionally connected to a service control point (SCP), a method for storing automatic recall-related information in said SCP, said method comprising:

generating a packet indicating that a communication in association with a subscriber line functionally connected to said switch has gone unanswered;

sending said packet to said SCP;

in response to receiving said packet, causing said SCP to extract said automatic recall-related information from said packet; and

storing a directory number of a first subscriber terminal unit, a time stamp of said communication, and a privacy indicator of said automatic recall-related information of said communication at said SCP.

6,041,113

INTERFACE METHOD PERFORMED BY MODEM BETWEEN BASE STATION AND CONTROL STATION

Hyung-Taeg Ryoo, Kwacheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd, Rep. of Korea

Filed Dec. 11, 1997, Appl. No. 988,573

Claims priority, application Rep. of Korea, Feb. 18, 1997, 97-4847

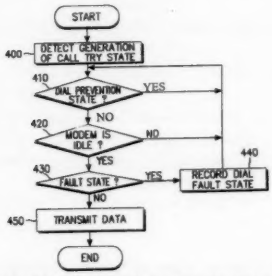
Int. Cl.[7] H04M *3/42*

U.S. Cl. 379—209 **13 Claims**

1. An interface method performed by a modem between a base station and a control station, comprising the steps of:

(a) detecting the generation of call try;

(b) checking whether or not a dial prevention state is generated;



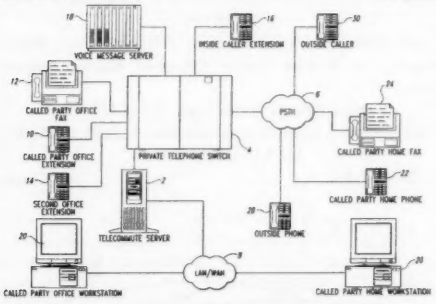
(c) checking a state of the modem when the dial prevention state was generated; and

(d) retrying the call in response to the state of the modem.

6,041,114
TELECOMMUTE SERVER

Kevin L. Chestnut, Seattle, Wash., assignor to Active Voice Corporation, Seattle, Wash.

Filed Mar. 27, 1997, Appl. No. 825,206
Int. Cl.[7] H04M *3/42*
U.S. Cl. 379—211 **41 Claims**



1. A method for managing a telecommunications system in which call forwarding is determined by whether a computer terminal is logged into a computer network, comprising:

a) receiving a call on a telephone system which is coupled to a computer network;

b) determining with a server the identity of a called party to whom said call should be directed;

c) identifying with the server one of a plurality of network logon devices associated with said called party that is logged-on to said computer network;

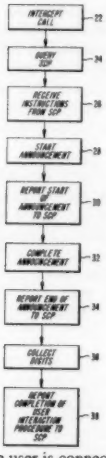
d) identifying with the server a telephone number associated with said logged-on network logon device; and

e) forwarding the call to said telephone number, the forwarded call bypassing the server.

6,041,115
USER INTERACTION PROCEDURE

Bart Jellema, Rijen; René Peeren; Louise Croughan, both of Osterhart, and Freek Aben, Rykevoort, all of Netherlands, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 17, 1997, Appl. No. 895,836
Claims priority, application United Kingdom, Jul. 19, 1996, 9615151
Int. Cl.[7] H04M *7/00;1/64;11/00;3/42*
U.S. Cl. 379—230 **9 Claims**

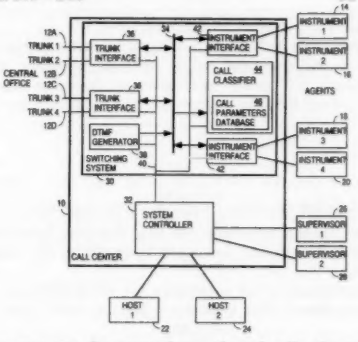


1. A method of handling a user interaction procedure during a telephone call, in a network including a switching point and a control point, in which the user is connected to the switching point and the switching point is connected to the control point, the user interaction procedure including a plurality of stages during which messages are sent from the switching point to a user, and from the user to the switching point, but not from the control point to the switching point, the method comprising sending at least one report from the switching point to the control point during the user interaction procedure.

6,041,116
METHOD AND APPARATUS FOR CONTROLLING OUTBOUND CALLS

John D. Meyers, Arlington, Tex., assignor to Aspect Telecommunications Corporation, San Jose, Calif.

Filed May 5, 1997, Appl. No. 850,990
Int. Cl.[7] H04M *3/00*
U.S. Cl. 379—244 **31 Claims**



1. An apparatus for processing outbound calls, the apparatus comprising:

a system controller to control placement of an outbound call to a called number, wherein the called number has an associated country;

a storage mechanism to store a plurality of sets of call classification parameters, wherein each set of call classification parameters is associated with a particular country and is indicative of a set of outbound call results for outbound calls to the particular country, the set of outbound call results including at least one answered result and at least one unanswered result; and

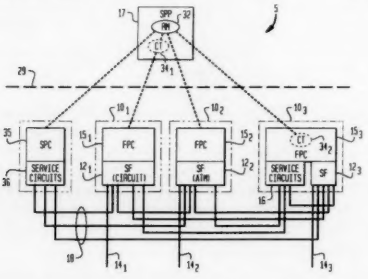
a call classifier coupled to the system controller, wherein the call classifier is to generate an outbound call result for the outbound call based on call classification parameters associated

with the country associated with the called number, the generated outbound call result being either an answered result, indicating that the outbound call was answered, or an unanswered result, indicating that the call was not answered.

6,041,117
DISTRIBUTED NETWORK CONTROL AND FABRIC APPLICATION INTERFACE

Frank J. Androski, Freehold; Nancy Binowski, Bridgewater; James Ehlinger, Colts Neck; Jerry Allen Robinson, Middletown, and Daniel Sheinbein, Elizabeth, all of N.J., assignors to AT&T Corp, New York, N.Y.

Filed Feb. 28, 1997, Appl. No. 808,298
Int. Cl.[7] H04M *3/00;7/00*
U.S. Cl. 379—268 **27 Claims**



1. A telecommunication network that includes a plurality of switching systems, each including a switching fabric for performing call connection processes and a control mechanism for the switching fabric, the improvement comprising:

at least one switch processing platform coupled to each of the switching systems for performing at least one of a call processing, service processing, signal message processing, address translation and routing functions, and for controlling call connection processes performed by the switching fabrics by

a) receiving a request for call processing, and

b) responsive to the call processing request, distributing at least one command to at least one switching system through its control mechanism to command said one switching fabric to perform said call connection process.

6,041,118
ARCHITECTURE FOR TELEPHONE SET

Alan Dean Michel, Nobleville, and Eric Williams, Indianapolis, both of Ind., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of application No. 08/363,454, Dec. 22, 1994, abandoned. This application Jan. 22, 1997, Appl. No. 787,487.
Int. Cl.[7] H04M *1/00*
U.S. Cl. 379—391 **7 Claims**

1. A communication apparatus, comprising:

a) a telephone, in which a signal path runs between

i) a handset, which produces and receives analog signals, and

ii) an input, which is connectable to an analog telephone line;

b) a digital signal processor (DSP), interconnected in the signal path, for communicating with both the input and the handset;

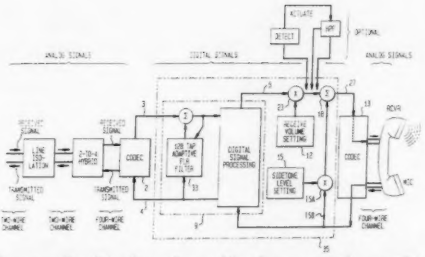
c) interfaces, for interfacing between

i) the telephone line and the DSP, and

ii) the DSP and the handset;

d) a digital high-pass filter, for boosting high frequencies in received signals;

e) means for adjusting volume of signals produced by the receiver; and

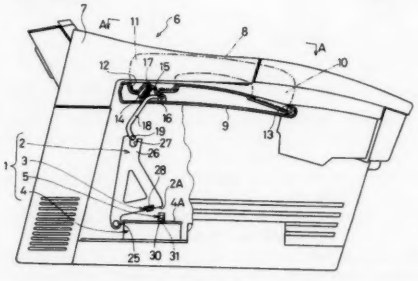


f) means for detecting when said volume exceeds a predetermined level and, in response, activating said high-pass filter.

6,041,119
HANDSET DETECTION DEVICE FOR USE IN TELEPHONES

Hiroyuki Kato, and Masahiko Sasa, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 24, 1998, Appl. No. 65,513
Claims priority, application Japan, May 6, 1997, 9-115422
Int. Cl.[7] H04M *1/00*
U.S. Cl. 379—424 **15 Claims**



1. A handset detection device for use in telephones provided with a handset and a handset holding base, for detecting the handset at a point of time whereat the handset is placed on the handset holding base, the handset detection device comprising:

a movable member which moves in a predetermined direction upon a placement of the handset on the handset holding base;

a stopper member for stopping the movable member by coming into contact with a contact portion of the movable member, the stopper member being disposed below the movable member;

a detector for detecting the movable member stopped by the stopper member to detect the placement of the handset on the handset holding base, the detector being disposed on the stopper member; and

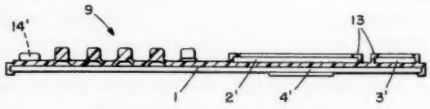
an elastic member for reducing a moving speed of the movable member before it is stopped by the stopper member coming into contact with the contact portion of the movable member, the elastic member being disposed in a vicinity of the contact portion of the movable member.

6,041,120

INSTALLATION AND ASSEMBLY HOLDING MAT FOR A TELEPHONE

Jari Olkkola, Salo, Finland, assignor to Nokia Mobile Phones Limited, Espoo, Finland

Continuation of application No. 08/529,018, Sep. 15, 1995, abandoned. This application Jun. 13, 1997, Appl. No. 874,800.
Claims priority, application Finland, Sep. 16, 1994, 944300
Int. Cl.[7] H04M *1/00*
U.S. Cl. 379—433 **15 Claims**



1. In a hand telephone having a body, a printed circuit board located inside the body, and at least one electrical component electrically connected to the printed circuit board, the body having an aperture proximate the component, wherein the improvement comprises:

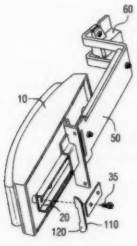
a one-piece mat located inside the body, the mat having the printed circuit board fixedly connected onto a first side of the mat and the electrical component located in a hole in the mat at an opposite second side of the mat, wherein the mat is securely mounted between two parts of the body and forms a sealing packing between the two parts of the body.

6,041,121

HANDSET ACCESS MECHANISM AND METHOD

Vinh Hew Diep, Milpitas, and Najibullah Naikal, Union City, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 30, 1997, Appl. No. 885,839
Int. Cl.[7] H04M *1/00*
U.S. Cl. 379—446 **18 Claims**



1. A latching access mechanism for a telephone comprising:

an upper slide for attachment to a telephone base;

a latch mounted on alternatively supporting said upper slide in either a first retracted position or in a second extended position;

lower slide for engaging and slidably supporting said upper slide;

a mounting bracket secured to said lower slide;

a latching mechanism attached on said mounting bracket,

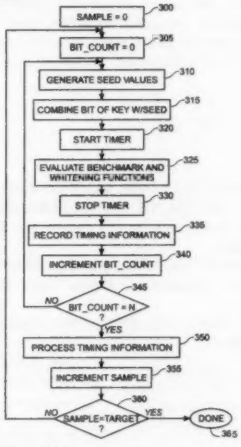
wherein said upper slide is engaged by and may slidably travel along said lower slide so that said latch may be mated with said latching mechanism in the retracted or extended position.

6,041,122

METHOD AND APPARATUS FOR HIDING CRYTOGRAPHIC KEYS UTILIZING AUTOCORRELATION TIMING ENCODING AND COMPUTATION

Gary L. Graunke, Beaverton, and David W. Aucsmith, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 27, 1998, Appl. No. 32,594
Int. Cl.[7] H04L *9/00*
U.S. Cl. 380—21 **56 Claims**



1. A method comprising:

generating a plurality of timing statistics based on an amount of time required to evaluate a particular function given a known input for a series of computations used in deriving the cryptographic key:

deriving the cryptographic key in a bitwise fashion based, at least in part, on a comparison of the generated timing statistics and timing statistics stored in the electronic device to determine whether bits of a derived cryptographic key correspond to bits in the cryptographic key; and

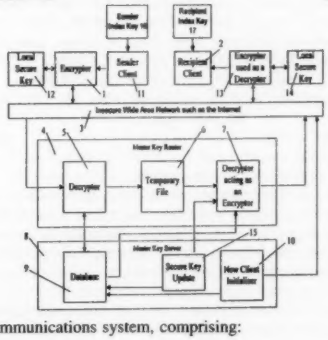
using a subset of the derived cryptographic key for authentication prior to complete derivation of the cryptographic key.

6,041,123

CENTRALIZED SECURE COMMUNICATIONS SYSTEM

Bryan Colvin, Sr., San Jose, Calif., assignor to Allsoft Distributing Incorporated, San Jose, Calif.

Filed Jul. 1, 1996, Appl. No. 673,122
Int. Cl.[7] H04L *9/00*
U.S. Cl. 380—49 **14 Claims**



1. A communications system, comprising:

a transmitting client and a receiving client, each client having an associated secure key and an encryptor/decryptor for encrypting and decrypting messages using the secure key; and

a master key router remotely disposed from the transmitting client and the receiving client having a decryptor for decrypting messages encrypted with the secure key of the transmitting client, and having au encryptor for encrypting messages with the secure key of the receiving client;

wherein messages between the transmitting client and the receiving client pass through the master key router, and wherein the master key router is configured to decrypt the message using the secure key of the sending client and a unique algorithm associated with the sending client and encrypt the message using the secure key of the receiving client and a unique algorithm associated with the receiving client.

6,041,124

RADIO COMMUNICATION SYSTEM AND METHOD AND MOBILE COMMUNICATION TERMINAL DEVICE

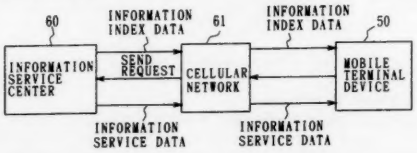
Takehiro Sugita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1996, Appl. No. 769,003

Claims priority, application Japan, Dec. 19, 1995, P07-349356

Int. Cl.[7] **H04L** *9/00;* **H04B** *1/69;* **H04J** *13/02*

U.S. Cl. 380—270 **27 Claims**



22. A radio communication system for enabling radio communications between a base station unit and a mobile communication terminal device using a code division multiple access method, including means for transmitting requested information different from speech information from said base station unit to said mobile communication terminal device,

said base station unit including means for transmitting update data corresponding to said requested information to said mobile communication terminal device, and

said mobile communication terminal device including means for determining whether said requested information has been updated.

6,041,125

ACTIVE ACOUSTIC WALL

Masaharu Nishimura; Keizo Ohnishi; Chiaki Yasuda; Shinichiro Kajii, all of Takasago, Japan; William P. Patrick, and Anthony C. Zander, both of East Hartford, Conn., assignors to Mitsubishi Jukogyo Kabushiki Kaishal, Tokyo, Japan, and United Technologies Corporation, Conn.

Filed Dec. 19, 1996, Appl. No. 769,381

Claims priority, application Japan, Aug. 15, 1996, 8-215685

Int. Cl.[7] **A61F** *11/06*

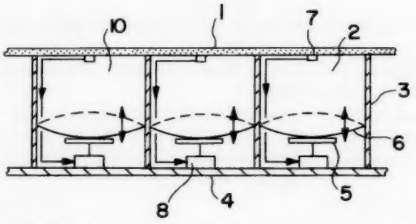
U.S. Cl. 381—71.4 **32 Claims**

1. An active acoustic wall for absorbing sound waves across a broadband frequency range, comprising:

a perforated plate comprising at least one selected from the group consisting of a perforated member and a porous material, said perforated plate having a front side and a back side;

a back wall spaced from said back side of said perforated plate such that a space is formed between said back side of said perforated plate and said back wall;

a plurality of partition plates dividing said space between said perforated plate and said back wall into a plurality of sections;



oscillation plates provided within each of said sections, respectively;

driving units for driving said oscillation plates;

two sound pressure detectors provided within each of said sections providing first and second signals; and

a signal processing unit connected with said sound pressure detectors and said driving units, receiving each of said first and second signals, calculating the impedance of each of said sections, comparing the impedance to a predetermined value, and providing an output signal to each of said driving units such that each of said oscillation plates oscillates and creates an impedance which approximates said predetermined value.

6,041,126

NOISE CANCELLATION SYSTEM

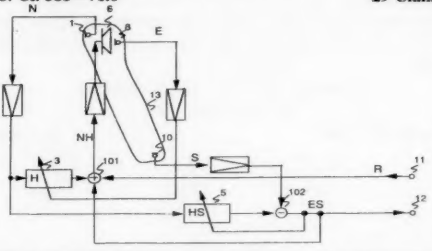
Kenichi Terai, Shijyonawate, and Hiroyuki Hashimoto, Daito, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 24, 1996, Appl. No. 685,573

Claims priority, application Japan, Jul. 24, 1995, 7-187467

Int. Cl.[7] **A61F** *11/06*

U.S. Cl. 381—71.6 **29 Claims**



10. A noise cancellation system having a mouth position and an ear position, and comprising:

noise detecting means for detecting noise,

a talking microphone installed near the mouth position,

a speaker installed near the ear position,

filter means connected to the noise detecting means,

adding/subtracting means for adding or subtracting by using an output of the talking microphone and an output of the filter means, and sending out the result to a talking signal output terminal, and

voice detecting means for detecting a voice signal from the output signal from the talking microphone,

wherein the filter means receives the detected noise, and a coefficient of the filter means is updated by using the added or subtracted result directly from the adding/subtracting means,

the coefficient of the filter means is not updated when the voice detecting means has detected the voice signal, and

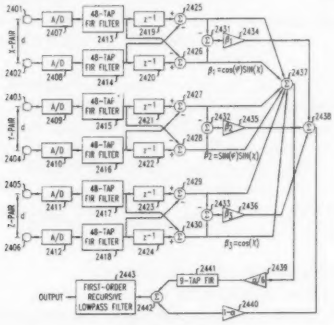
the signal to be sent to the talking signal output terminal is also substantially sent to the speaker.

6,041,127

STEERABLE AND VARIABLE FIRST-ORDER DIFFERENTIAL MICROPHONE ARRAY

Gary Wayne Elko, Summit, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 3, 1997, Appl. No. 832,553
Int. Cl.[7] H04R *3/00*
U.S. Cl. 381—92 **26 Claims**



1. A microphone array operating over a given audio frequency range, the microphone array comprising:

a plurality of individual pressure-sensitive microphones which generate a corresponding plurality of individual microphone output signals, each individual pressure-sensitive microphone having a substantially omnidirectional response pattern, the plurality of individual microphones comprising three or more individual microphones arranged in an N-dimensional spatial arrangement where N>1, the spatial arrangement locating each of said individual microphones at a distance from each of the other individual microphones which is smaller than a minimum acoustic wavelength defined by said audio frequency range of operation; and

a processor adapted to compute a plurality of difference signals and an omni signal having a substantially omnidirectional response pattern, each difference signal comprising an algebraic difference between two of said individual microphone output signals corresponding to a pair of said individual microphones, the omni signal having an amplitude and a phase and comprising an additive aggregation of two or more of said individual microphone output signals, the processor further adapted to selectively weight each of said plurality of difference signals and said omni signal, and to produce a microphone array output signal based upon a combination of said selectively weighted difference signals and said selectively weighted omni signal, such that the microphone array output signal thereby has a steerable response pattern having an orientation of maximum reception based upon said selective weighting of said plurality of difference signals and said omni signal.

6,041,128

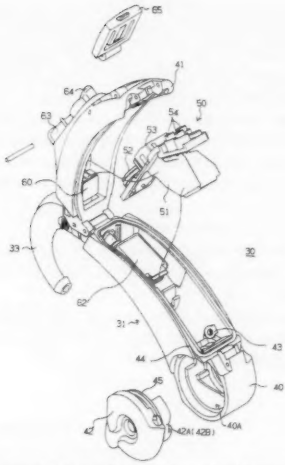
BATTERY RECEIVING CHAMBER AND HEARING AID

Yoshiyuki Narisawa, and Toshiyuki Araki, both of Tokyo, Japan, assignors to Rion Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1995, Appl. No. 380,553
Claims priority, application Japan, Jan. 31, 1994, 6-027389; Feb. 4, 1994, 6-033063; Feb. 4, 1994, 6-033160
This patent is subject to a terminal disclaimer.
Int. Cl.[7] H04R *25/00*
U.S. Cl. 381—322 **7 Claims**

4. A waterproof externally worn hearing aid, comprising:

a concave part provided in a first side face of a case, wherein said case is formed in a curvature shape as a whole and said first side face of said case touches skin of a user when said hearing aid is worn;



an air vent provided in a bottom face of said concave part for communicating with the interior of said case and the exterior of said case;

waterproof means being disposed so as to block said air vent, for supplying air from the outside of said case to the interior of said case through said air vent, and for preventing invasion of moisture from the outside of said case through said air vent; and

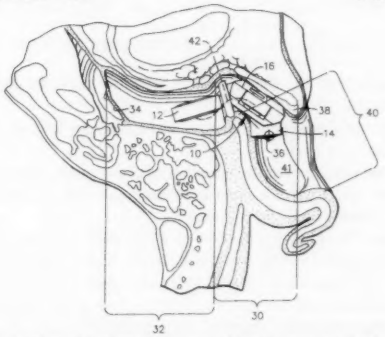
a slot extending from said concave part to a second side face of said case on said hearing aid, wherein said second side face of said case of said hearing aid does not touch skin of the user when said hearing aid is worn.

6,041,129

HEARING APPARATUS

Roger A. Adelman, 957 Riverwatch Dr., Villa Hills, Ky. 41017-3769

Continuation of application No. 08/303,161, Sep. 8, 1994, abandoned. This application Jan. 18, 1996, Appl. No. 599,445.
Int. Cl.[7] H04R *25/00*
U.S. Cl. 381—328 **3 Claims**



1. A hearing aid adapted for use with a human ear having an external sound collecting surface and an auditory canal, the canal having a tympanic membrane at its innermost terminus, a bony canal portion extending outward from the tympanic membrane to an anatomical position where the canal continues as a cartilaginous part, said cartilaginous part having a S-shaped sigmoid portion and an outermost canal entrance portion, the sigmoid portion being anatomically deep relative to the entrance portion, the entrance portion extending to a tragus, said canal entrance portion providing

access to the auditory canal for airborne sound, said canal entrance being opposite to a conchal bowl which collects and aims sound that has been captured by the external sound collecting surface toward said canal entrance portion, the hearing aid comprising:

(a) a microphone for receiving airborne sound, said microphone being placed within the auditory canal and being positioned anatomically deep relative to both the tragus and the outermost entrance to the external auditory canal with its receiving surface facing the conchal bowl, said microphone being operative to produce electrical signals in response to the airborne sound waves it receives;

(b) an electronic circuit operative to produce a processed output signal in response to the electrical signals produced by the microphone; and

(c) a speaker positioned in the external auditory canal responsive to the output signal of the electronic circuit for converting the output signal into sound waves.

6,041,130

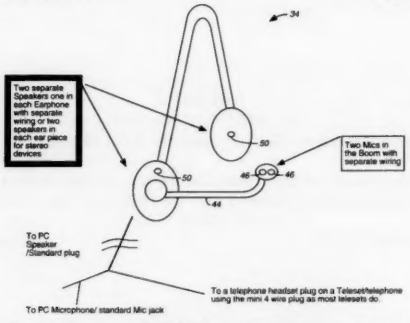
HEADSET WITH MULTIPLE CONNECTIONS

Raymond G. Goss, Austin, Tex., assignor to MCI Communications Corporation, Washington, D.C.

Filed Jun. 23, 1998, Appl. No. 103,114

Int. Cl.[7] **H04R** *25/00*

U.S. Cl. 381—374 **6 Claims**


34
Two separate Speakers one in each Earphone with separate wiring or two speakers in each ear piece for stereo devices
50
50
46
46
Two Mics in the Boom with separate wiring
44
To PC Speaker /Standard plug
To a telephone headset plug on a Telesetitelephone using the mini 4 wire plug as most telesets do.
To PC Microphone/ standard Mic jack

1. A headset for communicating with two separate devices, comprising:

a mounting member for mounting and holding the headset on the head of a wearer;

at least a first speaker for receiving input communication signals and converting the input communication signals to audible communications for the wearer;

means for connecting the speaker to the mounting member for holding the speaker adjacent to an ear of the wearer;

first and second microphones for receiving audible communications from the wearer and converting said audible communications to output communication signals;

a boom member connecting the microphones to the mounting member for holding the microphones adjacent to the mouth of the wearer; and

a signal conducting circuit for transmitting input communication signals from at least the first device to the first speaker, and for transmitting output communications from the first and second microphones to the first and second devices respectively.

6,041,131

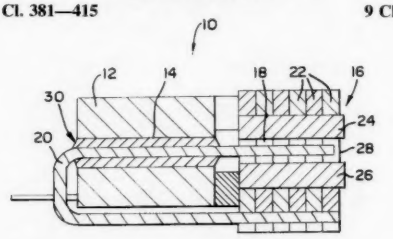
SHOCK RESISTANT ELECTROACOUSTIC TRANSDUCER

Dennis Ray Kirchhoefer, Plainfield; Thomas Edward Miller, Arlington Heights, and Paris Tsangaris, Naperville, all of Ill., assignors to Knowles Electronics, Inc., Itasca, Ill.

Filed Jul. 9, 1997, Appl. No. 890,075

Int. Cl.[7] **H04R** *1/00*

U.S. Cl. 381—415 **9 Claims**



1. A hearing aid transducer comprising:

a coil defining an elongated tunnel;

a magnet structure defining an elongated gap in axial alignment with the tunnel;

an armature aperture including the tunnel within the coil and the gap within the magnet structure;

an armature extending through the armature apertures; and

a fluid with a viscosity greater than air within at least a portion of the armature aperture and at least partially maintained therein by capillary attraction.

6,041,132

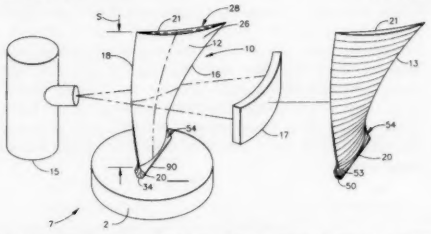
COMPUTED TOMOGRAPHY INSPECTION OF COMPOSITE PLY STRUCTURE

Ralph G. Isaacs, Cincinnati, and Joseph M. Portaz, Hamilton, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 29, 1997, Appl. No. 902,565

Int. Cl.[7] **G06K** *9/00;* **A61B** *6/00*

U.S. Cl. 382—100 **20 Claims**



1. A computerized method for displaying an image of a subject ply of a subject object made of a composite material, said method comprising the steps of:

(a) generate and store a reference model of a subject object made of a composite material having a plurality of actual plies, said reference model comprising at least one reference ply in a Non-Euclidian coordinate system and corresponding Euclidian coordinates;

(b) three-dimensionally X-ray scan the subject object and use computed tomography (CT) to produce subject multiple slice data comprising subject CT slices that are substantially normal to the actual plies of the subject object;

(c) transform points of the reference ply to a Euclidian coordinate system of the subject object and register the points to the subject object; and

(d) determine intensity values of transformed and registered points in the Euclidian coordinate system from at least some of the slice data in the vicinity of the transformed points.

6,041,133

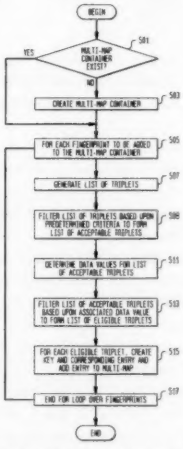
METHOD AND APPARATUS FOR FINGERPRINT MATCHING USING TRANSFORMATION PARAMETER CLUSTERING BASED ON LOCAL FEATURE CORRESPONDENCES

Andrea Califano, New York, N.Y.; Scott Eric Colville, Madison, Wis., and Robert Steven Germain, Tuckahoe, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1996, Appl. No. 764,949

Int. Cl.[7] **G06K** *9/00;9/48;9/62*

U.S. Cl. 382—124 **46 Claims**


BEGIN
501
MULTI-MAP CONTAINER EXIST?
YES
NO
503
CREATE MULTI-MAP CONTAINER
505
FOR EACH FINGERPRINT TO BE ADDED TO THE MULTI-MAP CONTAINER
507
GENERATE LIST OF TRIPLETS
509
FILTER LIST OF TRIPLETS BASED UPON PREDETERMINED CRITERIA TO FORM LIST OF ACCEPTABLE TRIPLETS
511
DETERMINE DATA VALUES FOR LIST OF ACCEPTABLE TRIPLETS
513
FILTER LIST OF ACCEPTABLE TRIPLETS BASED UPON ASSOCIATED DATA VALUE TO FORM LIST OF ELIGIBLE TRIPLETS
515
FOR EACH ELIGIBLE TRIPLET, CREATE KEY AND CORRESPONDING ENTRY AND ADD ENTRY TO MULTI-MAP
519
END FOR LOOP OVER FINGERPRINTS
END

1. In a system wherein at least one fingerprint image is stored in a database, a method for generating and storing data characterizing said fingerprint image, the method comprising the steps of:

identifying a plurality of feature points in said fingerprint image, wherein said feature points are derived from singularities in ridge patterns in said fingerprint image;

grouping said plurality of feature points into a first plurality of subsets, wherein each subset is associated with a predetermined number K of feature points, wherein K is an integer in the range K>3;

for at least one subset of said first plurality of subsets of feature points,

generating an entry comprising an identifier that identifies said fingerprint image,

generating a key that corresponds to said at least one subset of feature points, wherein said key characterizes said fingerprint image in the vicinity of said at least one subset of feature points wherein said key is based upon at least one of:

ridge count data which represents a ridge count between pairs of feature points in said at least one subset of feature points,

distance data which represents distance between pairs of feature points in said at least one subset of feature points, and

ridge angle data which represents local direction of a ridge associated with feature points in said at least one subset of feature points; and

storing said entry in a memory, wherein said key is associated with said entry.

6,041,134

ERGONOMIC FINGERPRINT READER HOUSING

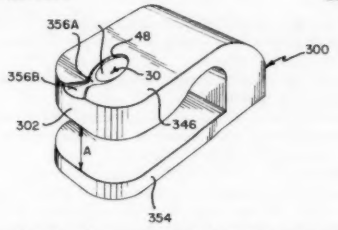
John Michael Merjanian, Burlington, Mass., assignor to The National Registry, Inc., St. Petersburg, Fla.

Continuation of application No. 08/836,242, filed as application No. PCT/US95/14374, Oct. 28, 1995, Pat. No. 5,920,642. This application Feb. 10, 1999, Appl. No. 248,063.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06K** *9/00*

U.S. Cl. 382—126 **20 Claims**



1. A housing for a fingerprint acquisition device, comprising:

a platen having a platen surface adapted to be contacted by a digit of a person's hand, and

first and second surfaces,

the first surface having an aperture therethrough, the platen being disposed within the housing and the platen surface being in register with the aperture,

the second surface being displaced from the first surface to provide a grasping surface,

the housing being shaped to orient the digit relative to the platen to ensure a firm grip of the housing and also being shaped such that the second surface contacts four digits of the user's hand while a chosen, fifth digit is positioned on the platen in the first surface.

6,041,135

FAST INTERACTIVE OFF-LINE PROCESSING METHOD FOR RADIOGRAPHIC IMAGES

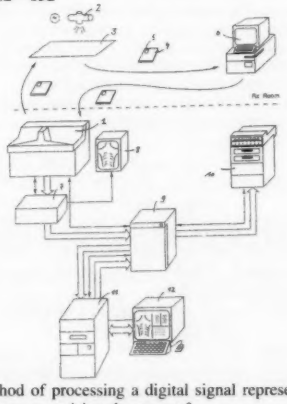
Tom Guido Buytaert, Nieuwelei 58, B-2640 Mortsel; Stefan Clemens Van de Velde, Steenbergdstraat 8, B 1982 Elewijt, and Pieter Paul Vuylsteke, Quinten Matsijslei 3, B 2640 Mortsel, all of Belgium

Continuation-in-part of application No. 08/643,556, May 6, 1996, which is a continuation of application No. 08/083,914, Jun. 28, 1993, Pat. No. 5,546,473. This application Nov. 6, 1997, Appl. No. 965,577.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06K** *9/00*

U.S. Cl. 382—132 **14 Claims**



1. A method of processing a digital signal representation of an original image comprising the steps of:

1)—applying a decomposition transformation to said image to transform it into a decomposed image comprising a sequence of detail images at multiple successively lower spatial resolution levels and a residual image at a still lower resolution level, wherein each detail image represents the amount of local variation of pixel values within said original image at the resolution level of the detail image and wherein a residual image is an approximation of said original image with omission of all variations comprised in said detail images,

2)—storing said detail images and said residual image into a memory,

3)—retrieving from said memory detail images up to a predetermined resolution level among said multiple resolution levels, and said residual image,

4)—processing retrieved detail images in accordance with a set of processing parameters,

5)—generating a reconstructed image by applying the inverse of the decomposition transformation to the images processed in step 4 and to the residual image,

6)—displaying said reconstructed image and evaluating it,

7)—amending the numerical values of said processing parameters based on the result of said evaluation and repeating method steps 3 to 6 until the result of said evaluation satisfies an operator.

6,041,136

IMAGE PROCESSING APPARATUS AND METHOD

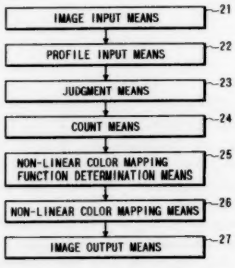
Manabu Ohga, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1996, Appl. No. 623,374

Claims priority, application Japan, Mar. 30, 1995, 7-073335

Int. Cl.[7] G06K *9/00*

U.S. Cl. 382—162 **11 Claims**



1. An image processing apparatus comprising:

input means for inputting image data representing an image;

judgement means for judging a color distribution of the image on the basis of the input image data;

generation means for generating a color mapping condition so as not to appear discontinuous in a combined portion of linear mapping and non-linear mapping, on the basis of a combination condition of linear mapping and non-linear mapping according to the judged color distribution; and

process means for performing a color mapping process by using the generated color mapping condition.

6,041,137

RADICAL DEFINITION AND DICTIONARY CREATION FOR A HANDWRITING RECOGNITION SYSTEM

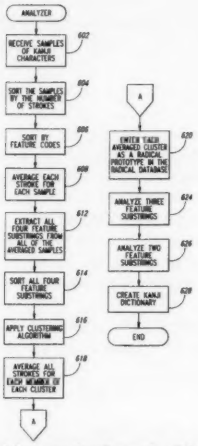
Michael Van Kleeck, Seattle, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Aug. 25, 1995, Appl. No. 519,425

Int. Cl.[7] G06K *9/72*

U.S. Cl. 382—185 **24 Claims**

1. A method in a computer system for identifying radicals for a plurality of Kanji characters, each of the plurality of Kanji characters comprising at least one radical, the method comprising:



receiving handwriting samples for each of the plurality of Kanji characters, each handwriting sample comprising at least one stroke;

grouping the handwriting samples for each of the plurality of Kanji characters by the number of strokes within each handwriting sample;

categorizing each stroke of each handwriting sample based on the shape of the stroke;

averaging the handwriting samples within each group that have the same categorization of strokes;

determining characteristics common to two or more of the averaged samples;

identifying the characteristics common to two or more of the averaged samples as radicals;

storing the identified radicals into the computer system; and

mapping each of the plurality of Kanji characters onto the at least one radical that comprises the Kanji character.

6,041,138

METHOD AND DEVICE FOR EXTRACTING FEATURES FROM GRAY-SCALE IMAGE AND GENERATING BOUNDARIES OF DOCUMENT ELEMENTS

Hirobumi Nishida, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 17, 1997, Appl. No. 896,142

Claims priority, application Japan, Aug. 5, 1996, 8-206268

Int. Cl.[7] G06K *9/62*

U.S. Cl. 382—197 **13 Claims**

1. A method of extracting features from a gray-scale image, said method comprising the steps of:

a) generating polygons which approximate a curved surface represented by said gray-scale image;

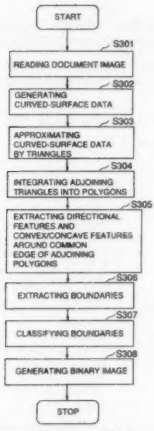
b) extracting features with respect to common edges of adjoining polygons; and

c) generating boundaries of document elements based on said features,

wherein said step b) comprises the steps of

b1) cutting said surface by a horizontal plane to generate intersection lines between said horizontal plane and said polygons around each one of said common edges,

b2) extracting directional features with respect to each one of said common edges based on said intersection lines, and



b3) extracting convex/concave features with respect to each one of said common edges based on said intersection lines.

6,041,139

IMAGE PROCESSING APPARATUS

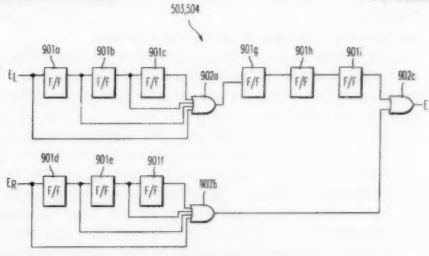
Hiromi Okubo, Yokohama, and Rie Ishii, Souka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 17, 1996, Appl. No. 664,492

Claims priority, application Japan, Jun. 16, 1995, 7-150348

Int. Cl.[7] G06K *9/48*

U.S. Cl. 382—199 **14 Claims**



1. An image processing apparatus comprising:

edge judging means for judging a presence or absence of an edge pixel for input image data, wherein the edge judging means includes a left edge pixel detecting means having an output connected to an input of a left edge expanding means, and a right edge pixel detecting means in parallel with the left edge pixel detecting means, and having an output connected to an input of a right edge expanding means, the left and right edge pixel detecting means receiving the input image data in parallel,

wherein said left edge expanding means expands a left edge pixel detecting result toward a pixel at a front side in a main scanning direction and said right edge expanding means expands a right edge pixel detecting result toward a rear side in the main scanning direction, and wherein the edge pixel detecting results are respectively input into an OR circuit and the presence or absence of the edge pixel is based on taking a logical sum of the expanded left edge pixel detecting result, which is delayed based on a difference between expanding directions in the left edge and right edge pixel expanding means, and the expanded right edge pixel detecting result; and

plural halftone processing means, wherein one of said plural halftone processing means is selected in accordance with the judgment result of said edge judging means.

6,041,140

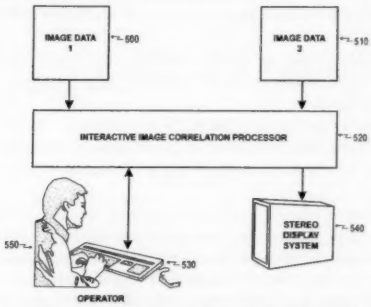
APPARATUS FOR INTERACTIVE IMAGE CORRELATION FOR THREE DIMENSIONAL IMAGE PRODUCTION

Bruce W. Binns, Melbourne Beach, Fla.; Rodney M. Price, Chamblee, Ga.; Charles S. Palm, Westlake Village, Calif., and Suzanne E. Weaver, Melbourne Beach, Fla., assignors to Synthonics, Incorporated, Westlake Village, Calif.

Filed Oct. 4, 1994, Appl. No. 318,047

Int. Cl.[7] G06K *9/62*

U.S. Cl. 382—209 **7 Claims**



1. A reconfigurable hardware accelerator board comprising:

a. an onboard bus terminated in a connector for connecting to a bus of a computer,

b. one or more field programmable gate arrays capable of being partially reprogrammed during execution of a program, connected to the bus,

c. a memory accessible by said one or more field programmable gate arrays,

d. a processor for loading a plurality of program modules in said memory, each for configuring said one or more field programmable gate arrays, and for reconfiguring the programmable gate arrays during the execution of a program to implement in hardware selected program modules stored in memory in which the field programmable gate arrays are configured to provide:

e. at least one module for defining a series of correlation references patches each around a reference point and for specifying the locations of candidate patches for correlation with each reference patch,

f. at least one module for performing an image correlation computation by comparing each reference patch with candidate patches, and

g. at least one module for selecting the candidate patch which best correlates with a reference patch.

6,041,141

CHARACTER RECOGNITION MACHINE UTILIZING LANGUAGE PROCESSING

Hiroshi Yamamoto, Katano; Hisao Niwa, Osaka; Yoshihiro Kojima, Kobe; Susumu Maruno, Osaka; Kazuhiro Kayashima, Hirakata; Toshiyuki Kouda, Nara; Hidetsugu Maekawa, Hirakata; Satoru Ito, Katano, and Yasuharu Shimeki, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of application No. 08/125,658, Sep. 23, 1993, abandoned. This application Aug. 10, 1995, Appl. No. 513,294.

Claims priority, application Japan, Sep. 28, 1992, 4-257801; Dec. 10, 1992, 4-330169; Dec. 10, 1992, 4-330170; Mar. 12, 1993, 5-051918; Sep. 7, 1993, 5-221766

Int. Cl.[7] G06K *9/68*

U.S. Cl. 382—231 **7 Claims**

1. A character recognition machine having a language processing portion capable of processing language, said language processing portion comprising:

a character string image storage portion for storing an image input;

a word search portion for receiving a set of candidate characters and determining a set of candidate words, using a word dictionary, based on a degree of similarity between the candidate characters and the characters in various character positions in the character string image;

a phrase search portion for finding candidate phrases from the set of candidate words, using a grammatical dictionary;

a phrase evaluating value-calculating portion for calculating correctness of each phrase in terms of vocabulary and grammar;

a phrase-selecting portion for selecting one phrase, based on evaluating values of phrases, and producing a modified character string;

a character recognition portion for recognizing a portion of a character image corresponding to one character and producing a set of character categories and their degrees of similarity; and

a candidate character comparator portion which compares a character category having a maximum degree of similarity and applied from said character recognition portion with said corresponding modified character string and, when said character category differs from said modified character string, produces both a modified character category and a character position corresponding to the modified character category as additional learning characters to said character recognition portion.

6,041,142

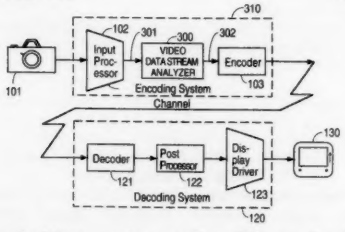
ANALYZER AND METHODS FOR DETECTING AND PROCESSING VIDEO DATA TYPES IN A VIDEO DATA STREAM

R. Padmanabha Rao, Sunnyvale, and Amanda L. Chin, Fremont, both of Calif., assignors to General Instrument Corporation, Horsham, Pa.

Division of application No. 08/162,511, Dec. 2, 1993, Pat. No. 5,828,786. This application Apr. 8, 1996, Appl. No. 630,089.

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—232 **10 Claims**



1. A method for improving encoding efficiency of a video data stream, said method comprising the steps of:

analyzing each frame in said video data stream to detect frames that include a mid-frame edit in real time, wherein said mid-frame edit comprises odd and even parity fields that belong to different scenes, wherein said different scenes differ in video two and frame rate;

dropping a first field in a frame in which a mid-frame edit was detected in real time; and

replacing said first field with a second field in said frame in which a mid-frame edit was detected in real time thereby eliminating an abrupt change in activity with said frame and so improving encoding efficiency.

6,041,143

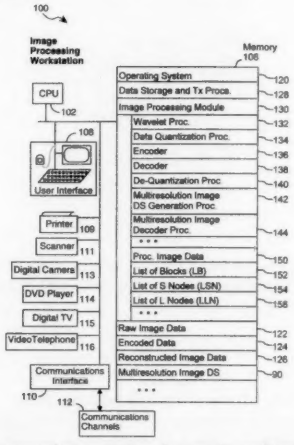
MULTIRESOLUTION COMPRESSED IMAGE MANAGEMENT SYSTEM AND METHOD

Charles K. Chui, Menlo Park, and Lefan Zhang, Sunnyvale, both of Calif., assignors to Teralogic Incorporated, Mountain View, Calif.

Filed Apr. 14, 1998, Appl. No. 60,398

Int. Cl.[7] G06K *9/36*

U.S. Cl. 382—232 **22 Claims**



1. Image processing apparatus, for use in conjunction with an image display device, the image processing apparatus comprising:

a memory device for storing data, including a first image data structure, the first image data structure including a first array of wavelet transform coefficients corresponding to a full resolution image;

a data processor coupled to the memory device;

a multiresolution image management procedure, executable by the data processor, including instructions for generating an image at any of a plurality of selectable resolution levels, the instructions including:

image reconstruction instructions for applying an inverse wavelet or wavelet-like transform to a specified set of image data so as to generate image data for displaying a corresponding image on the image display device; and

image data extraction instructions, for use when an image resolution level lower than full resolution is selected, wherein the image data extraction instructions generate a second image data structure from the first image data structure by extracting a subset of the wavelet transform coefficients from the first array and storing the extracted subset in a second array in the second image data structure;

wherein the image reconstruction instructions operate on the second image data structure when an image resolution level lower than full resolution is selected and operate on the first image data structure when a full image resolution is selected.

6,041,144

IMAGE PROCESSING APPARATUS

Susumu Sugiura, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1992, Appl. No. 945,396

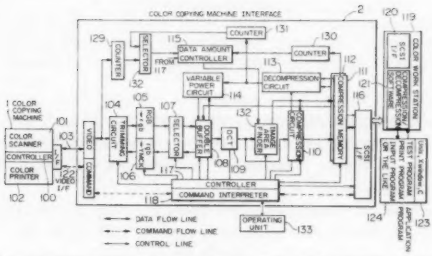
Claims priority, application Japan, Sep. 17, 1991, 3-236185; Sep. 17, 1991, 3-236186

Int. Cl.[7] G06K *9/46*

U.S. Cl. 382—239 **11 Claims**

1. An image processing apparatus comprising:

input means for inputting non-compressed image data for each of a plurality of pixels:



first counter means for counting a first total amount of non-compressed image data which has been input by said input means and outputting a first counted value representing the first total amount, wherein the first total amount of the non-compressed image data is independent of the spatial characteristics of the non-compressed image data;

compression means for compressing the non-compressed image data input by said input means, wherein the compression is controlled in accordance with a controllable parameter that controls a compression ratio, said compression means including orthogonal transforming means for transforming the image data into orthogonal transformed coefficients and quantizing means for quantizing the orthogonal transformed coefficients based on the controllable parameter;

second counter means for counting a second total amount of compressed image data which has been compressed by said compression means from the input image data and outputting a second counted value representing the second total amount; and

control means for controlling the parameter used by said compression means in accordance with the first and second counted values.

6,041,145

DEVICE AND METHOD FOR SMOOTHING PICTURE SIGNAL, DEVICE AND METHOD FOR ENCODING PICTURE AND DEVICE AND METHOD FOR DECODING PICTURE

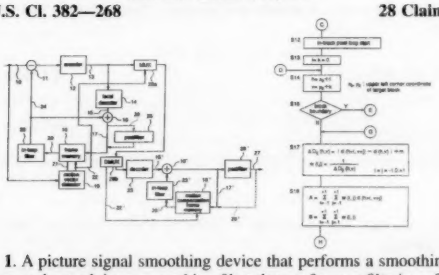
Takaaki Hayashi, Fukuoka, and Minoru Etoh, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of application No. 08/742,909, Nov. 1, 1996, abandoned. This application Jul. 15, 1998, Appl. No. 115,907.

Claims priority, application Japan, Nov. 2, 1995, 7-285838; Nov. 5, 1996, 8-292447

Int. Cl.[7] **G06K** *9/40;9/36*

U.S. Cl. 382—268 **28 Claims**



1. A picture signal smoothing device that performs a smoothing process by applying a smoothing filter that performs a filtering of a sampled and digitized picture signal by weighted mean of a target pixel and its surrounding pixels, including:

means for detecting a difference between the target pixel and the surrounding pixels;

means for taking an absolute value that represents a magnitude of the difference;

means for adding a non-negative value to the absolute value that represents a magnitude of the difference thus detected, wherein said non-negative value is equal for all surrounding pixels;

means for taking an inverse number of the value after the adding and thereby generating a weighting factor;

means for multiplying a value after taking of the inverse number, and the surrounding pixels value together;

means for taking a sum (A) of a plurality of values after the multiplying;

means for taking a sum (B) of a plurality of weighting factors alone;

means for normalizing the sum (A) by dividing the same by the sum (B) of the weighting factors; and

means for smoothing the target pixel in accordance with the normalized sum (A).

6,041,146

IMAGE READING APPARATUS FOR READING BOOK-LIKE DOCUMENTS

Koichi Kamon, Takatsuki, and Shinya Matsuda, Kyoto, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 9, 1996, Appl. No. 599,380

Claims priority, application Japan, Feb. 14, 1995, 7-050467

Int. Cl.[7] **G06K** *9/40*

U.S. Cl. 382—274 **22 Claims**

21. An image reader for reading a book document placed on a document platen in a face upward condition, said image reader comprising:

a shading reference panel provided beside the document platen,

an image reading device for reading the book document and the shading reference panel, and for outputting image data,

first detecting means for detecting a height distribution of the book document, said height distribution comprising a plurality of vertical height measurements of a document surface above the platen,

second detecting means for detecting an illuminance irregularity in accordance with the image data corresponding to the shading reference panel,

calculating means for calculating shading correction data based on analysis of an elevation difference between the shading reference panel and the document surface and the illuminance irregularity corresponding to the shading reference panel, and

shading correction means for correcting an illuminance irregularity of the image data corresponding to the book document in accordance with the shading correction data.

6,041,147

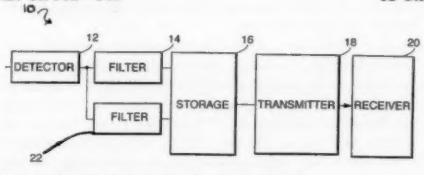
CONTENT-BASED INDEXING OF IMAGES BY CODING LEVELS DEFINED AS A FUNCTION OF REDUCED ENTROPY

Donald C. Mead, Carlsbad, Calif., assignor to Hughes Electronics Corporation, El Segundo, Calif.

Filed Oct. 15, 1996, Appl. No. 732,803

Int. Cl.[7] **G06K** *9/54;9/60*

U.S. Cl. 382—305 **12 Claims**



12. An image indexing system comprising:

indexing by retrieving a selected image feature in a class of compressed data images according to image content based on hierarchical compression transform basis functions, the func-

tion being selected as a function of identifying a reduced Eigenvalue pattern for said class;

viewing selected individual sub-images according to a low frequency sub-image content; and

decoding a selected image by reversing the hierarchical compression, adding a residual image and displaying the resulting selected image as a lossless reproduction of said selected image.

6,041,148

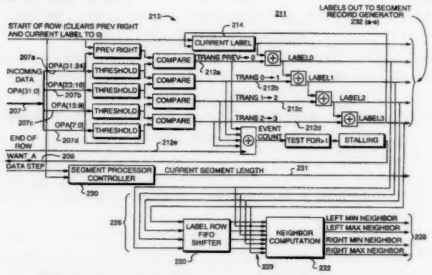
SYSTEM AND METHOD FOR EXTRACTING IMAGE DATA

Michael J. Wilt, Windham, N.H., assignor to Acuity Imaging, LLC, Nashua, N.H.

Continuation-in-part of application No. 08/953,772, Oct. 17, 1997. This application Feb. 19, 1998, Appl. No. 25,937.

Int. Cl.[7] **G06K** *9/56*

U.S. Cl. 382—308 **13 Claims**



1. A data extraction system comprising:

at least one data storage memory for storing data formatted into a plurality of data samples, each of said plurality of data samples having multiple bits;

a data extraction processor, for receiving said data from said data storage memory one processor word at a time, wherein a processor word includes at least two of said data samples, for simultaneously processing said at least two of said data samples in each said processor word, and for generating at least one result record containing information extracted from said data samples in at least one said processor word, said data extraction processor comprising a segmentation processor including:

a label computation engine, coupled to said data flow controller, for simultaneously receiving said data samples in each said processor word, for identifying transitions between said data samples and generating transition bit signals for each potential transition, and for computing a label code for each said potential transition using said transition bit signals;

a label row FIFO shifter, coupled to said label computation engine, for receiving and storing said label code for each said potential transition;

a neighborhood computation unit, coupled to said label computation engine and to said label row FIFO shifter, for receiving current row labels from said label computation engine and previous row labels from said label row FIFO shifter, and for computing connecting relationships to segments in a previous row;

a segment processor controller, coupled to said data flow controller, for providing a current segment length; and

a segment record generator, coupled to said label computation engine, said segment processor controller and said neighborhood computation unit, for receiving said current row labels, said current segment length, and information about said connecting relationships, and for generating at least one segment record for each transition event; and

a data flow controller, coupled between said at least one data storage memory and said data extraction processor, for controlling the flow of processor words into said data extraction processor and the flow of said result records out of said data extraction processor.

6,041,149

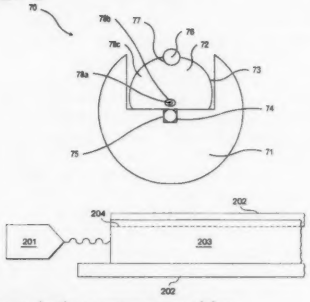
GROOVED OPTICAL FIBER FOR USE WITH AN ELECTRODE AND A METHOD FOR MAKING SAME

Thomas D. Monte, Lockport, Ill., assignor to KVH Industries, Inc., Middletown, R.I.

Continuation of application No. 08/611,172, Mar. 5, 1996, Pat. No. 5,768,462. This application Jun. 16, 1998, Appl. No. 97,958.

Int. Cl.[7] **G02B** *6/02*

U.S. Cl. 385—2 **3 Claims**



1. A communications system, comprising:

a transmitter, for generating optical signals;

an electrode for applying voltage; and

an optical fiber having refractive properties which change in response to an applied voltage and having a groove for receiving the electrode.

6,041,150

MULTIPASS CAVITY SENSOR FOR MEASURING A TISSUE-EQUIVALENT RADIATION DOSE

Friedrich Wolfgang Hasing, Jülich; Frank Pfeiffer, Nürnberg, and Harald Büker, Jülich, all of Germany, assignors to Forschungszentrum Julich GmbH, Julich, Germany

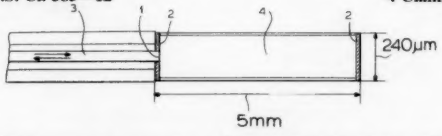
PCT No. PCT/DE96/02321, § 371 Date Jun. 1, 1998, § 102(e) Date Jun. 1, 1998, PCT Pub. No. WO97/21112, PCT Pub. Date Jun. 12, 1997

PCT Filed Dec. 2, 1996, Appl. No. 77,819

Claims priority, application Germany, Dec. 2, 1995, 195 45 060

Int. Cl.[7] **G02B** *6/00*

U.S. Cl. 385—12 **4 Claims**



1. A sensor for measuring a tissue-equivalent radiation dose, comprising:

an elongated radiation-sensitive light waveguide disposed in an ionizing radiation field;

mirrors on opposite ends of said waveguide for multiple back and forth reflections of light from end to end within said waveguide whereby said waveguide forms a multipath cavity for light in said waveguide; and

means for coupling light into and out of said waveguide.

6,041,151

ALL OPTICAL SWITCH

David Mendlovic, Petach Tikva, and Dan M. Marom, Tel Aviv, both of Israel, assignors to Ramot University Authority for Applied Research & Industrial Development Ltd., Tel Aviv, Israel

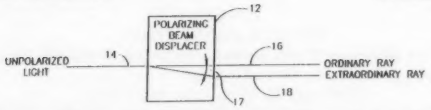
PCT No. PCT/IL96/00079, § 371 Date Feb. 17, 1998, § 102(e) Date Feb. 17, 1998, PCT Pub. No. WO97/09536, PCT Pub. Date Mar. 13, 1997

PCT Filed Aug. 12, 1996, Appl. No. 11,706

Claims priority, application Israel, Aug. 25, 1995, 115075

Int. Cl.[7] **G02B** *6/26*

U.S. Cl. 385—16 **13 Claims**



1. An optical switch for switching first and second input beams linearly polarized in the same direction, comprising:

a first half wave plate optically coupled to the second input beam, said first half wave plate for rotating the polarization of light incident thereto 90 degrees:

a first polarizing beam displacer optically coupled to the first input beam and the output of said first half wave plate, said first polarizing beam displacer for refracting the first input beam and the output of said first half wave plate to produce a combined beam, the first input beam and the output of said first half wave plate incident to said first polarizing beam displacer displaced from each other a predetermined distance;

a controllable half wave gate having a gate input port, a gate output port, a control input, a passive state and an active state, said controllable half wave gate in said passive state passing said combined beam incident to said gate input port through to said gate output port whereby the polarization of said combined beam is unchanged, said controllable half wave gate in said active state passing said combined beam incident through to said gate input port through to said gate output port whereby the polarization of said combined beam is rotated 90 degrees, a control signal present at said control input causing said controllable half wave gate to switch between said passive and said active states, said gate including a ferroelectric liquid crystal shutter,

a second polarization beam displacer optically coupled to said gate output port, said second polarization beam displacer for refracting light incident thereto into first and second refracted output beams displaced from each other a predetermined distance upon exiting said second polarization beam displacer; and

a second half wave plate optically coupled to said second refracted out beam, said second refracted output beam, said second half wave plate for rotating the polarization of light incident thereto 90 degrees.

6,041,152

MULTI-CHANNEL FIBER OPTIC COMMUNICATIONS SYSTEM AND MULTIPLEXER/DEMULTIPLEXER ARRANGEMENT THEREFOR

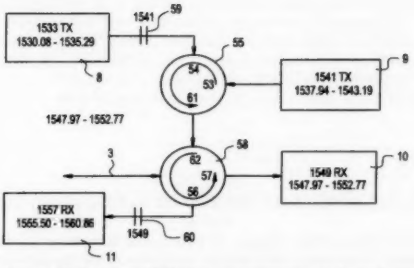
Timothy Edward Clark, Lisle, Ill., assignor to Amphenol Corporation, Wallingford, Conn.

Filed Sep. 2, 1997, Appl. No. 921,797

Int. Cl.[7] **G02B** *6/28;* **H04J** *14/02*

U.S. Cl. 385—24 **19 Claims**

1. In a multiple channel communications system including an optical fiber transmission line and at least two cascaded wavelength division multiplexing components at each end of the transmission line, the improvement wherein said at least two wavelength division multiplexing components at each end of the transmission line is coupled to the transmission line via combiners, at least one of said combiners at one end of the transmission line being arranged to multiplex groups of signals from said cascaded



wavelength division multiplexing components, each said group forming a different set of channels, and at least one of said combiners at said second end of the transmission line being arranged to demultiplex said groups of different wavelength signals received over the transmission line from said cascaded wavelength division multiplexing components and distribute the demultiplexed groups to at least two of the cascaded wavelength division multiplexing components at said second end of the transmission line,

wherein said combiners are bi-directional combiners, and at least one of said multiplexing components at each end of the transmission line is a cascaded multiple channel multiplexer, and at least one of said multiplexing components at each end of the transmission line is a cascaded multiple channel demultiplexer.

wherein said cascaded multiple channel multiplexer comprises:

a plurality of Mach-Zehnder interferometer units, each unit comprising a pair of 50/50 fiber optic couplers connected by a pair of Bragg gratings and three functional ports including two multi-channel input/output ports, and one single channel input port, said Bragg gratings being tuned to a wavelength of the single channel input port;

means for connecting a plurality of transmitters respectively to said single channel input ports;

means for connecting input/output ports of adjacent said interferometer units in a cascade configuration; and

a common output port on a last of said cascaded interferometer units, said common output port of each multiplexer being connected to a different input port of one of the combiners.

6,041,153

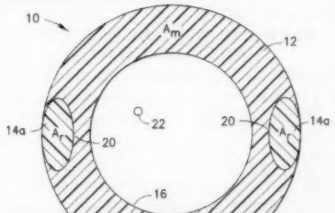
CONTINUOUS COMPOSITE REINFORCED BUFFER TUBES FOR OPTICAL FIBER CABLES

Houching M. Yang, Conover, N.C., assignor to Alcatel, Paris, France

Filed Jul. 1, 1998, Appl. No. 108,683

Int. Cl.[7] **G02B** *6/44*

U.S. Cl. 385—109 **20 Claims**



20. An optical fiber cable, comprising:

a composite reinforced buffer tube comprising an extruded elongated thermoplastic matrix having a plurality of elongated, substantially continuous, reinforcements incorporated therein along its length between its inside and outside walls, the

continuous reinforcements being co-extruded with the elongated thermoplastic matrix and bonded to the matrix at interface regions therebetween, wherein the reinforcements have a higher flexural modulus than the thermoplastic matrix, and wherein the reinforcements have a coefficient of thermal expansion less than the thermoplastic matrix; and

at least one optical fiber disposed in the buffer tube.

6,041,154

IMAGE FIBER AND METHOD OF FABRICATING THE SAME

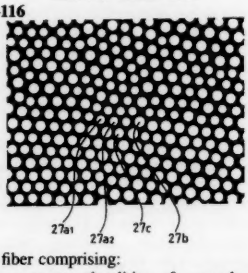
Katsuya Ono, Hino; Masaru Shiraiwa, and Kimihiko Nishioka, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of application No. 08/418,690, Apr. 7, 1995, abandoned. This application Jan. 27, 1998, Appl. No. 14,165.

Claims priority, application Japan, Apr. 8, 1994, 6-070764; Jul. 28, 1994, 6-176779; Sep. 5, 1994, 6-095107; Feb. 7, 1995, 7-019319

Int. Cl.[7] G02B *6/06*

U.S. Cl. 385—116 **12 Claims**



1. An image fiber comprising:

at least three separate pluralities of cores having respective different sectional shapes and respective equal sectional areas; and

a common cladding containing said separate pluralities of cores,

wherein said separate pluralities of cores are arrayed so that any core included in one of said separate pluralities of cores is adjacent to a core included in a remaining one of said separate pluralities of cores,

each core of at least 50% of said separate pluralities of cores is prevented from being adjacent to cores of a same plurality of cores among which said each core belongs,

wherein said each core is a portion of said image fiber that transmits light.

6,041,155

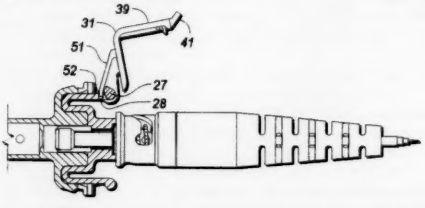
UNIVERSAL DUST COVER

David C. Anderson, St. Louis, Mo., and Daniel Lee Stephenson, Lilburn, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 10, 1997, Appl. No. 988,520

Int. Cl.[7] G02B *6/00*

U.S. Cl. 385—139 **18 Claims**



1. In combination, a coupling adapter and a dust cover wherein said adapter comprises a connector receptacle, said combination comprising:

a dust cover member having a front surface adapted to cover said receptacle;

a pivot member, said pivot member having a cam member thereon;

first and second spaced pivot arms extending toward said pivot member, each of said pivot arms having a distal end having means for pivotably engaging said pivot member; and

a spring arm extending between said dust cover and said cam member having a distal end adapted to bear against said cam member.

6,041,156

OPTICAL CONNECTION

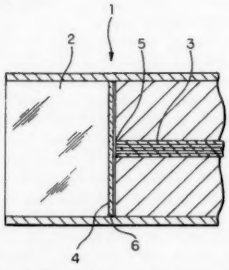
Walter Heitmann, Gross-Bieberau, Germany, assignor to Deutsche Telekom AG, Bonn, Germany

Filed Aug. 28, 1998, Appl. No. 143,132

Claims priority, application Germany, Aug. 28, 1997, 197 37 498

Int. Cl.[7] G02B *6/00*

U.S. Cl. 385—139 **10 Claims**



1. An optical connection for use in an optical fiber system having an operating wavelength, the optical connection comprising:

at least one optical fiber having an end face and an optical fiber hardness;

an optical window having a surface disposed opposite the optical fiber end face; and

a thin, absorption-free protective coating at the optical window surface, the protective coating having a hardness greater than the optical fiber hardness and having an optical thickness small compared to the operating wavelength.

6,041,157

ENVIRONMENTALLY SENSITIVE COMPOSITIONS OF MATTER BASED ON 3H-FLUOREN-3-YLIDENES AND PROCESS FOR MAKING SAME

Frederick James Goetz, 2320 Lighthouse La., Wilmington, Del. 19810

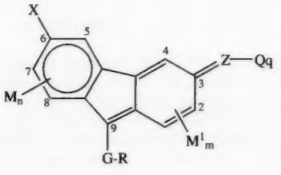
Provisional application No. 60/032,280, Dec. 3, 1996. This application Nov. 28, 1997, Appl. No. 980,446.

Int. Cl.[7] G02B *6/00;5/23*

U.S. Cl. 385—141 **2 Claims**

1. A 3H-fluoren-3-ylidene compound having structure 1:

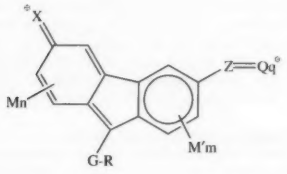
1



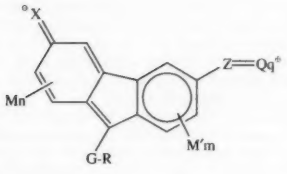
where

said structure may be represented as such or as electrically bipolar materially equivalent canonical structures 1D and 1A;

1D



1A

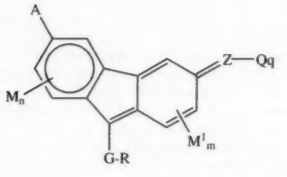


X- may be either D- or A-;

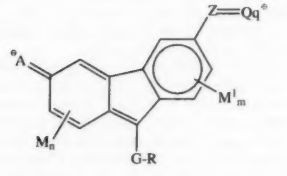
D- may be an electron-donating group J;

D- comprises D^1=Z- in structures 1D-a, 2A-a, or 2D-a, corresponding to $0D^1$-Z= in resonance canonical structures 1D-b, 2A-b, 2D-b, or D^2=C- in structures 1D-a, 2A-a, or 2D-a, corresponding to $0D^2$-C= in resonance canonical structures 1D-b, 2A-b, or 2D-b;

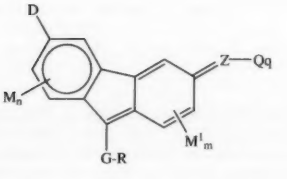
1A-a



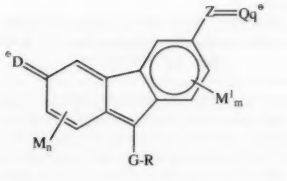
1A-b



1D-a

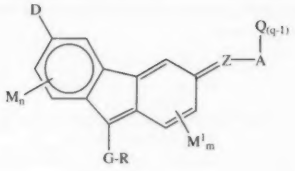


1D-b

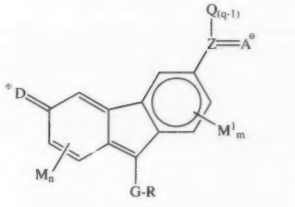


-continued

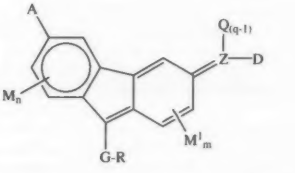
2A-a



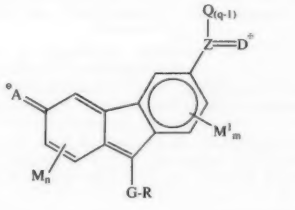
2A-b



2D-a



2D-b



where

D^1 and D^2 are substituted or unsubstituted unsaturated heterocyclic organic ring systems having one to (a−1) members being at least one electron donating heteroatom having one or two lone electron pairs being bonded to a carbon or to a heteroatom of the ring system and being J or L;

Z is N, P, As, Sb, Bi or C, Si, Ge being substituted or unsubstituted, the substituents being J, L, R^1, R^2, G-R, Q, T, Y, or R*;

Z^1 and Z^2 each independently have the same definition as Z;

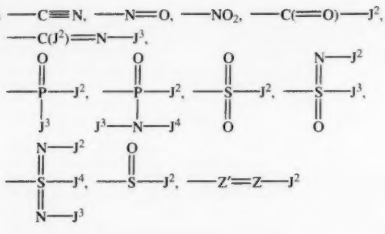
D^2=C- in structures 1D-a, 2A-a, or 2D-a, corresponding to $0D^2$-C= in resonance canonical structures 1D-b, 2A-b, or 2D-b, is a substituted or unsubstituted aromatic carbocyclic or substituted aromatic heterocyclic ring system,

where C of D^2=C- or $0D^2$-C= is a member of the ring system having b members and c J substituents,

where c is zero to (b−1) and each J substituent is the same or different, D^2=C- or $0D^2$-C= further having from zero to (b−c) additional substituents, the additional substituents being R^1, R^2, G-R^3,G-Q, G-T, G-Y, G-R*, Q, T,Y, or R*;

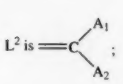
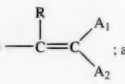
A- is an electron withdrawing L group;

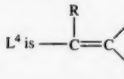
where

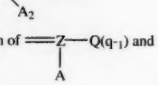
L = is 

L^1 independently has the same definition as L;

where J is an electron-donating group —R, R^1, R^2, R^3, $(CH_2)_n$—R^1, —S—R^1, —O—R^1, —N(R^1)(R^2), -G-R^1, —$(CH_2)_n$-G-R^1, —S-G-R^1, —O-G-R^1, —N(-G-R^1)(-G-R^2), —O—O—R^1, —O—O-G-R^1,—S—S—R^1,—S—S-G-R^1; J^1 is —$(CH_2)_n$—R^1, —S—R^1,—O—R^1 or —N(R^1)(R^2); J^2, J^3, and J^4 each independently have the same definition

L^2 is  ; L^3 is  ; and

L^4 is  ; where

L^2 is a possible representation of 

where A^1 and A^2 are independently each an electron-withdrawing L group or A^1 and A^2 together may form a substituted or unsubstituted ring system when the L group contains a R substituent, where R and the substituents for the A^1-A^2 ring system are independently J, L, R^1, R^2, G-R, Q, T, Y, or R*;

G is a diradical comprising substituted or unsubstituted —$(CH{=}CH)_n$—; n is an integer from 1 to 10, substituted or unsubstituted —$(CH_2)_w$—; w is an integer from 1 to 22, a substituted or unsubstituted aromatic ring system of 6 to 16 carbons or a substituted or unsubstituted aromatic heterocyclic ring system of 5 to 14 members in the ring system, the members being carbon and 1 to (g–1) heteroatoms; g is the number of members in the heterocyclic ring system, the heteroatoms being one or more of N, P, O, S, Se, or Te; G substituents being J^1 or L^1 with 6 being the maximum number of substituents;

R^1 and R^2 are independently H, F, Cl, Br, I, Q, T,Y alkyl of 1 to 22 carbons, cycloalkyl of 3 to 22 carbons, a substituted or unsubstituted aromatic ring system of 6 to 16 carbons or a substituted or unsubstituted aromatic heterocyclic ring system of 5 to 14 members in the ring system, the members being carbon atoms and 1 to (h–1) heteroatoms; h is the number of members in the heterocyclic ring system, the heteroatoms being one or more of N, P, O, S, Se, or Te; R^1 or R^2 substituents being J^1 or L^1 with 7 being the maximum number of substituents;

R^3 is H,F,Cl, Br, I, Q, T, Y alkyl of 1 to 22 carbons or cycloalkyl of 3 to 22 carbons;

R* is a chemically reactive group being carbonyl halides of 1 to 2 carbons; sulfonyl halides of 0 to 20 carbons; sulfinyl halides of 0 to 20 carbons; phosphoryl halides of 0 to 20 carbons; imidyl halides of 1 to 21 carbons; alkyl halides of 1 to 31 carbons; α-haloesters of 1 to 31 carbons; α-haloketones of 1 to 31 carbons; aryl halides of 6 to 32 carbons; heterocyclyl halides of 1 to 22 carbons and 1 to 21 heteroatoms one or more of which may be N, P, O, S, Se, and Te; cycloalkyl halides of 2 to 32 carbons. In addition, such reactive R* groups may be reactive unsaturated groups, such as, isocyanates; isothiocyanates; ketenes; olefines; acetylenes, allenes; ketones; α,β-diones; α,β,γ-triones; imines; α,β-diimines; azides; carbodimides; unsaturated ketones, esters, sulfonones, sulfonamides, and sulfonates; and carbon double bonded to heteroatoms, such as, P, S, Se, and Te; alcohols of 1 to 21 carbons; carboxylic acids of 1 to 21 carbons; sulfonic acids of 0 to 20 carbons; carboxamides of 1 to 21 carbons; sulfonamides of 0 to 20 carbons; amines of 1 to 30 carbons; aryl groups of 6 to 36 carbons; heteroaryl groups of 1 to 22 carbons and 1 to 21 heteroatoms one or more of which may be N, P, O, S, Se, or Te; mercaptans of 0 to 21 carbons; phosphates; alkali metals, such as, Li, Na, K, Rb, and Cs; alkaline earth metals, such as, Be, Mg, Ca, Sr, and Ba; transition metals; and metals of the B-group of the periodic table;

Q is a A,D, electron lone pair, or T group;

T is a polymerizable group being an a, b, unsaturated carbonyl of 4 to 26 carbons, vinyl ether of 3 to 25 carbons, carboxylic acid of 2 to 23 carbons, ester of 3 to 45 carbons, alcohol of 1 to 22 carbons, isocyanate of 1 to 22 carbons, isothiocyanate of 1 to 22 carbons, amine of 1 to 44 carbons, 1-substituted or 1,1-substituted alkylene of 2 to 44 carbons, polymerizable group of 1 to 44 carbons containing a nucleophilically replaceable group of zero to 22 carbons, where T substituents being G-Y, G-Q, and G-R*;

Y is a polymerization-initiating group being an α,β-dione of 2 to 22 carbons; an azoalkane of 1 to 21 carbons; an alkylperoxide of 1 to 21 carbons, a hydroperoxide of 0 to 20 carbons; a peroxide ester of 1 to 21 carbons; a persulfonate of 0 to 20 carbons; an α,β-disulfone of 0 to 20 carbons; an ester of 1 to 21 carbons; an ether of 1 to 21 carbons; an alcohol of 1 to 21 carbons; an amine of 1 to 41 carbons; a sulfonic acid of 0 to 20 carbons; a carboxamide of 1 to 21 carbons; an acid methyl of structure —CHA^1A^2 of 1 to 31 carbons; a substituted cyclopropane of 3 to 23 carbons; a substituted cyclobutane of 4 to 24 carbons; a substituted iodonium group of 1 to 31 carbons; a substituted sulfonium group of 2 to 42 carbons; Y Substituents on the polymerization-initiating group being J, L, R^1, R^2, G-R, G-Q, G-T, G-R*, Q, T, or R*;

M and M^1 are independently substituents of type J, L, R^1, R^2, Q, T, Y, G-R, G-Q, G-T, G-R*, and G-Y M substituents are n wherein n is in the range 0 to 3 and the number of M substituents is m where m is in the range 0 to 3;

M and M' are a carbocyclic or heterocylic ring system fused to positions 7 to 8 of structure 1 wherein the carbocyclic ring system is of 6 to 46 carbons and wherein the heterocyclic ring system is of 2 to 32 carbons and which may include up to 20 heteroatoms including one or more of: N, P, O, N, S, Se, Te, or I; M^1 may also be independently a carbocyclic or heterocyclic ring system fused to the positions 1 to 2 of structure 1 wherein the carbocyclic ring system is of 6 to 46 carbons and wherein the heterocyclic ring system is of 2 to 32 carbons and which may include up to 20 heteroatoms including one or more of: N, P, O, N, S, Se, Te, or I;

M and/or M^1 are independently -G- groups which connect directly proximal substituents of structure 1 including the X substituent at position 6, 5 and 7 and/or substituents upon these positions; the Z and/or Q substituents at positions 1, 2, 3, 4, 5, 6 or 7 and/or substituents upon these positions; where -G groups may be then independently substituted with substituents of type J, L, R', R^2, Q, R*, T, Y, G^1-R, G^1-Q, G^1-T, G^1-Y and G^1-R*, where G^1 has the same definition as G.

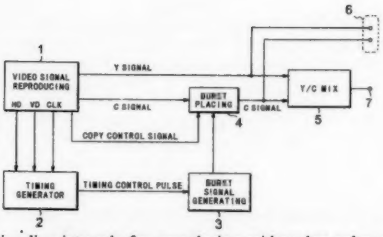
6,041,158

COPY PROTECTION BY INSERTING A PHASE-SHIFTED COLOR BURST SIGNAL INTO THE BURST INTERVAL OF AN ANALOG COLOR VIDEO SIGNAL

Hideo Sato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 18, 1996, Appl. No. 733,431
Claims priority, application Japan, Oct. 27, 1995, 7-303494
Int. Cl.[7] H04N *5/76*
U.S. Cl. 386—1 **47 Claims**

1. A method of allowing a direct reproduction of an analog color video signal and preventing said analog color video signal from being satisfactorily recorded and reproduced by an analog video recorder, wherein said analog color video signal includes a color burst signal of reference phase located in a burst interval in



respective line intervals for reproducing said analog color video signal, said method comprising the steps of:

generating a phase-shifted color burst signal which undergoes a time-axis expansion when recorded and reproduced by said analog video recorder; and

inserting said phase-shifted color burst signal in a predetermined location for a predetermined duration in an area of said burst interval of reference phase such that said phase-shifted color burst signal does not significantly interfere with the direct reproduction of said color analog video signal based on the color burst interval of reference phase and said time-axis expansion of said phase-shifted color burst signal significantly interferes with the color burst signal of reference phase thereby inhibiting the reproduction of the recorded analog color video signal when recorded and reproduced by said analog video recorder.

6,041,159

TELECOMMUNICATIONS DEVICE HAVING A REMOTE CONTROLLER

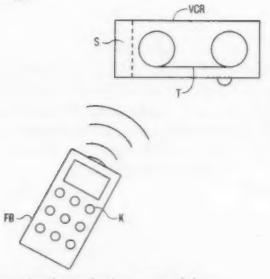
Hans-Joachim Platte, Hemmingen, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Filed Jun. 4, 1996, Appl. No. 658,138

Claims priority, application Germany, Jul. 11, 1995, 195 25 226

Int. Cl.[7] **H04N** *5/76*

U.S. Cl. 386—46 **5 Claims**



1. Telecommunications device comprising:

a circuit arrangement for distinguishing between information and program sections of a transmission in a program channel, wherein said circuit arrangement classifies said transmission of said program channel into a first type of a desired transmission and into a second type of additional information, said circuit arrangement evaluating a plurality of parameters to decide whether said first type of a desired transmission or said second type of additional information is being transmitted; and

a remote controller having a button which, when operated, causes said circuit arrangement to correct a previous transmission classification which is inappropriate or undesired from the point of view of a user, wherein said circuit arrangement works out again decisions that have taken place in a time period shortly before said button is operated and relate to said previous transmission classification with the aim of correction, defines a closest probable time for the decision for the preceding changeover between said two types in this time period as a new changeover time, and redefines parameters on which future transmission classification is based by matching the parameters to conditions of said new changeover time.

6,041,160

METHOD AND APPARATUS FOR PICTURE ENCODING AND DECODING

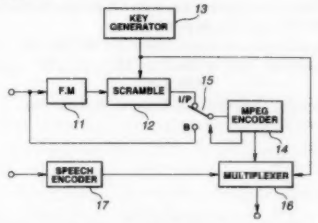
Yoichi Yagasaki, and Katsumi Tahara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 19, 1997, Appl. No. 879,038

Claims priority, application Japan, Jun. 21, 1996, 8-162236

Int. Cl.[7] **H04N** *5/91*

U.S. Cl. 386—94 **12 Claims**



1. A picture encoding method of encoding an input picture signal by an MPEG encoding method, comprising:

adding at least a set of invalid macro-blocks on a peripheral portion of a picture represented by the input picture signal;

outputting a signal identifying the position of the at least one set of added macro-blocks;

scrambling the picture signal by varying the position of the at least one set of macro-blocks responsive to a sequence;

MPEG encoding the scrambled picture signal; and

multiplexing the MPEG encoded picture signal with the position identifying signal.

6,041,161

INPUT-OUTPUT CIRCUIT, RECORDING APPARATUS AND REPRODUCTION APPARATUS FOR DIGITAL VIDEO SIGNAL

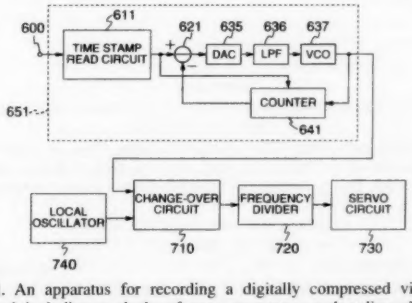
Hiroo Okamoto; Kyoichi Hosokawa; Hitoaki Owashi, all of Yokohama; Hiroaki Tachibana, Chigasaki, and Takaharu Noguchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of application No. 08/547,662, Oct. 24, 1995, abandoned. This application Nov. 18, 1997, Appl. No. 972,457.

Claims priority, application Japan, Oct. 28, 1994, 6-264874; Jun. 7, 1995, 7-140294

Int. Cl.[7] **H04N** *5/76*

U.S. Cl. 386—112 **10 Claims**



1. An apparatus for recording a digitally compressed video signal including a clock reference to restore a decoding clock signal on a magnetic recording medium by means of a rotary head,

said digitally compressed video signal being an intermittent input signal in packet form including a time stamp for the packet, comprising:

means for generating a reference signal for controlling the rotation of the rotary head in phase with the time stamp; and

means for controlling the rotation of said rotary head on the basis of the reference signal generated from said generating means.

6,041,162

METHOD FOR RECORDING VIDEO SIGNALS BY STORING DIGITAL VIDEO DATA INTO DCT BLOCKS FOR A DIGITAL VCR

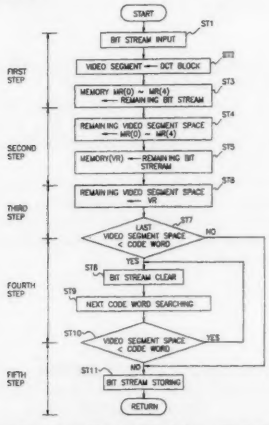
Byeongho Choi, Jeonrabook-Do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Continuation-in-part of application No. 08/492,700, Jun. 20, 1995, abandoned. This application May 21, 1997, Appl. No. 859,841.

Claims priority, application Rep. of Korea, Jun. 24, 1994, 94/14631

Int. Cl.[7] H04N *5/76*

U.S. Cl. 386—124 **14 Claims**



1. In a video data recording method for a digital video cassette tape reorder, wherein bit streams of video data are initially stored in video segments having remaining spaces, portions of the bit streams which are not initially stored in the video segments being sequentially stored in a memory as remaining bit streams, said video segments with a size of a remaining bit stream;

repeating a comparing step until a remaining bit stream having a size which is not larger than the size of the last remaining space of the video segments is found; and

storing the remaining bit stream found in said repeating step in the last remaining space of the video segments.

6,041,163

APPARATUS FOR CONTROLLING A PUMP MOTOR OF A FORKLIFT TRUCK

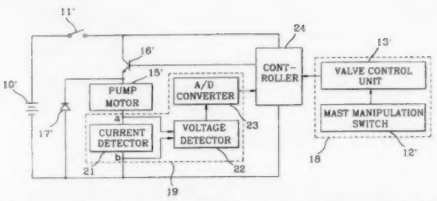
Wesley Robert Cherry, Jr., Mayfield Heights, Ohio, assignor to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea, and Daewoo Heavy Industries America Corporation, Carlstadt, N.J.

Filed Apr. 23, 1998, Appl. No. 64,854

Int. Cl.[7] H02P *5/17*

U.S. Cl. 388—811 **4 Claims**

1. An apparatus for controlling a pump motor of a forklift truck through the use of a driving transistor connected between a battery and the pump motor, comprising:



a) current detection means for detecting electric current flowing through the pump motor, the current detection means including,

(i) a shunt for sensing the current flowing through the pump motor to generate a first voltage signal, the shunt having a first terminal connected to the pump motor and a second terminal coupled to the battery,

(ii) means for amplifying the first voltage signal to a predetermined level to produce a second voltage signal, and

(iii) means for converting the second voltage signal to a current detection signal, the amplifying means includes: an operational amplifier with inverted and non-inverted input terminals, each connected to the first and second terminals of the shunt, and an output terminal; gain decision means having a first resistor connected between the inverted input terminal of the amplifier and the first terminal of the shunt, a second resistor connected between the inverted input terminal and the output terminal of the amplifier, a third resistor connected between the non-inverted input terminal of the amplifier and the second terminal of the shunt, and a fourth resistor connected to the inverted input terminal; and bias means for providing a bias voltage signal via the fourth resistor to the operational amplifier; and

b) control means responsive to the current detection signal for determining load condition of the pump motor to apply a varying control signal to the driving transistor so that a varying amount of electric current can be fed to the pump motor in proportion to the load exerting on the pump motor.

6,041,164

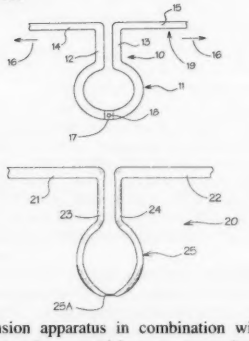
EXPANSION AND MOUNTING APPARATUS FOR INFRARED RADIANT ENERGY SOURCE

David V. Hofius, Sr., 235 Pierce Ave., Sharpsville, Pa. 15150, and Mark W. Hofius, 429 Line St., Sharpsville, Pa. 16150

Filed Nov. 4, 1998, Appl. No. 185,819

Int. Cl.[7] H05B *3/00*

U.S. Cl. 392—407 **12 Claims**



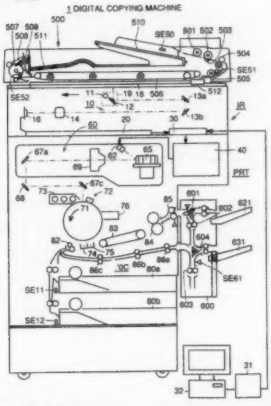
1. An expansion apparatus in combination with an infrared energy radiation wire comprising; an expansion loop formed within a portion of said infrared energy radiation wire, said loop having oppositely disposed contoured end portions within the loop, means for interconnecting said contoured end portions to one another within the loop.

6,041,165

IMAGE FORMING APPARATUS CAPABLE OF FORMING AN IMAGE AT A PLURALITY OF RESOLUTIONS

Takeshi Morikawa, Okazaki, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 30, 1997, Appl. No. 941,523
Claims priority, application Japan, Mar. 12, 1997, 9-057686
Int. Cl.[7] G06K *15/00*
U.S. Cl. 395—102 **10 Claims**



1. An image forming apparatus capable of image formation according to a print mode at different printing resolutions for a plurality of applications, comprising:

a resolution switching controller which controls switching of a printing resolution in response to switching between each of said plurality of applications; and

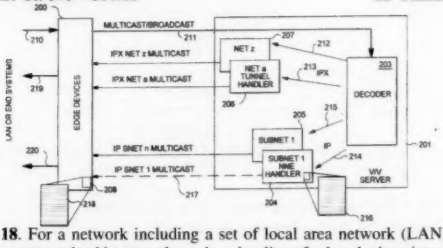
a timing controller which sets a timing of said switching of said printing resolution for said resolution switching controller according to said print mode.

6,041,166

VIRTUAL NETWORK ARCHITECTURE FOR CONNECTIONLESS LAN BACKBONE

John H. Hart, Saratoga, and W. Paul Sherer, Sunnyvale, both of Calif., assignors to 3Com Corp., Santa Clara, Calif.

Continuation-in-part of application No. 08/502,835, Jul. 14, 1995, Pat. No. 5,752,003. This application Jul. 15, 1996, Appl. No. 683,570.
Int. Cl.[7] G06F *15/16*
U.S. Cl. 395—200.68 **22 Claims**



18. For a network including a set of local area network (LAN) segments, a backbone path, and a plurality of edge devices interconnecting the set of LAN segments with the backbone path, the LAN segments interconnected as a virtual LAN, a server for managing traffic in the network, the server coupled to the backbone path, the server comprising:

resources on the server that receive a multidestination packet from an edge device, the multidestination packet having a multidestination address of a layer associated with a LAN;

a decoder that determines a logical network of the multidestination packet in response to a network protocol of the multidestination packet, wherein the logical network has membership less than the virtual LAN;

modules including modules associated with respective logical networks; and

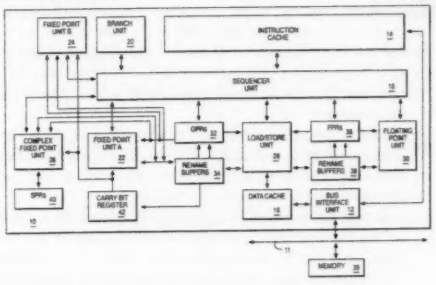
resources that pass the multidestination packet to a module among the modules, the module associated with the logical network, the module tunneling the multidestination packet to an agent on a particular edge device, on which the agent forwards the packet out ports from which members of the logical network can be reached.

6,041,167

METHOD AND SYSTEM FOR REORDERING INSTRUCTIONS AFTER DISPATCH IN A PROCESSING SYSTEM

Seungyoon Peter Song, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/220,993, Mar. 31, 1994, abandoned. This application Jul. 27, 1995, Appl. No. 508,121.
Int. Cl.[7] G06F *9/00*
U.S. Cl. 395—390 **21 Claims**



1. A processing system, comprising:

sequencer circuitry for initiating a plurality of processing stages of first, second and third instructions, said second instruction being an execution serialized instruction;

execution circuitry coupled to said sequencer circuitry; and

dispatch circuitry coupled to said execution circuitry for:

finishing a dispatch processing stage of said first instruction so that said first instruction is dispatched to said execution circuitry;

in response to finishing said dispatch processing stage of said first instruction, finishing a dispatch processing stage of a second instruction so that said second instruction is dispatched to said execution circuitry; and

in response to finishing said dispatch processing stage of said second instruction, finishing a dispatch processing stage of a third instruction so that said third instruction is dispatched to said execution circuitry; and

said execution circuitry being operable to reorder an execution sequence of said first, second and third instructions subsequent to said first, second and third instructions being dispatched to said execution circuitry and to initiate an execution processing stage of said dispatched third instruction prior to initiating an execution processing stage of said dispatched second instruction.

6,041,168

HIGH-SPEED DELAY VERIFICATION APPARATUS AND METHOD THEREFOR

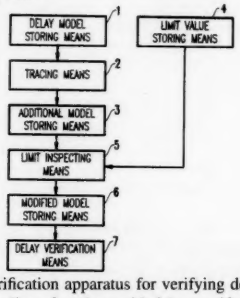
Takumi Hasegawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1996, Appl. No. 771,247

Claims priority, application Japan, Dec. 27, 1995, 7-340069

Int. Cl.[7] G06F *17/50*

U.S. Cl. 395—500.07 **20 Claims**



1. A delay verification apparatus for verifying delay of a circuit including a plurality of nodes, said delay verification apparatus comprising:

tracing means for respectively calculating, for each node of said circuit, a first delay time from each node to a starting point within said circuit and a second delay time from each node to an ending point within said circuit based on contents of a circuit model; and

limit inspecting means, to produce a modified circuit model to be verified, for following steps of:

a first deleting operation of deleting a node from the contents of a circuit model, said node having a sum of the first delay time and the second delay time which is less than a first predetermined value;

a second deleting operation of deleting a node from the contents of the circuit model, said node having a sum of the first delay time and the second delay time which is greater than a second predetermined value; and

a third deleting operation of deleting a node from the contents of the circuit model, said node having a sum of the first delay time and the second delay time which is less than the first predetermined value and greater than the second predetermined value, the second predetermined value being less than the first predetermined value.

6,041,169

METHOD AND APPARATUS FOR PERFORMING INTEGRATED CIRCUIT TIMING INCLUDING NOISE

Thomas C. Brennan, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1997, Appl. No. 915,941

Int. Cl.[7] G06F *13/50*

U.S. Cl. 395—500.07 **12 Claims**

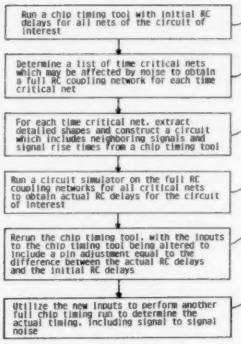
1. A method of performing timing analysis on an integrated circuit, comprising the steps of:

running a high level chip timing tool with initial RC delays for all nets of the integrated circuit;

determining a list of time-critical nets from a timing report and obtaining a full RC coupling network for each time-critical net;

running a detailed circuit simulator on the full RC coupling network for each time-critical net to obtain actual RC delays for each time-critical net;

determining a delta time for each time-critical net, based on a difference between the initial RC delay and the corresponding actual RC delay for each time-critical net; and


Run a chip timing tool with initial RC delays for all nets of the circuit of interest
202
Determine a list of time critical nets which may be affected by noise to obtain a full RC coupling network for each time critical net
204
For each time critical net, extract detailed shapes and construct a circuit which includes neighboring signals and signal rise times from a chip timing tool
206
Run a circuit simulator on the full RC coupling networks for all critical nets to obtain actual RC delays for the circuit of interest
208
Rerun the chip timing tool, with the inputs to the chip timing tool being altered to include a pin adjustment equal to the difference between the actual RC delays and the initial RC delays
210
Utilize the new inputs to perform another full chip timing run to determine the actual timing, including signal to signal noise
212

rerunning the high level chip timing tool, including the delta time for each time-critical net to obtain a timing analysis of the integrated circuit which accounts for signal to signal noise.

6,041,170

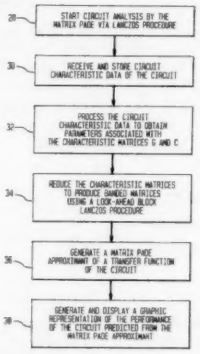
APPARATUS AND METHOD FOR ANALYZING PASSIVE CIRCUITS USING REDUCED-ORDER MODELING OF LARGE LINEAR SUBCIRCUITS

Peter Feldmann, Short Hills, and Roland W. Freund, New Providence, both of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Jul. 31, 1997, Appl. No. 904,233

Int. Cl.[7] G06F *17/50*

U.S. Cl. 395—500.23 **34 Claims**


START CIRCUIT ANALYSIS BY THE MATRIX PADE VIA LANCZOS PROCEDURE
28
RECEIVE AND STORE CIRCUIT CHARACTERISTIC DATA OF THE CIRCUIT
30
PROCESS THE CIRCUIT CHARACTERISTIC DATA TO OBTAIN PARAMETERS ASSOCIATED WITH THE CHARACTERISTIC MATRICES G AND C
32
REDUCE THE CHARACTERISTIC MATRICES TO PRODUCE BANDED MATRICES USING A LOOK-AHEAD BLOCK LANCZOS PROCEDURE
34
GENERATE A MATRIX PADE APPROXIMANT OF A TRANSFER FUNCTION OF THE CIRCUIT
36
GENERATE AND DISPLAY A GRAPHIC REPRESENTATION OF THE PERFORMANCE OF THE CIRCUIT PREDICTED FROM THE MATRIX PADE APPROXIMANT
38

24. A method for generating a frequency response signal of a circuit, the method comprising the steps of:

providing circuit characteristic data associated with the circuit;

generating characteristic matrix data associated with the circuit characteristic data representing parameters associated with characteristic matrices of the circuit characteristic data;

generating a symmetric matrix transfer function data relating to a matrix transfer function associated with the characteristic matrix data; and

generating the frequency response signal in response to the matrix transfer function data.

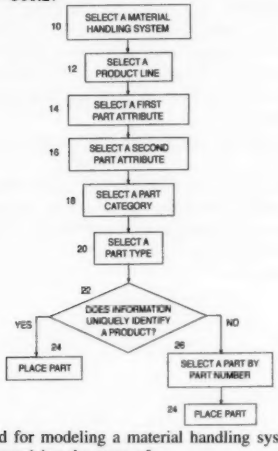
6,041,171
METHOD AND APPARATUS FOR MODELING MATERIAL HANDLING SYSTEMS

Dennis R. Blaisdell, W. Bloomfield; Bruce W. Mattison, South Lyon; Robert C. Farthing, Fenton, and Michelle A. Sarosy, Troy, all of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Provisional application No. 60/055,198, Aug. 11, 1997. This application Sep. 30, 1997, Appl. No. 941,211.

Int. Cl.[7] **G06F** *9/455*

U.S. Cl. 395—500.27 **50 Claims**



1. A method for modeling a material handling system in three dimensions comprising the steps of:

providing at least one memory means;

storing in digital form in said at least one memory means a set of instructions for designing and displaying a model of a fluid flow network comprising a plurality of fluid flow elements;

storing in digital form in said at least one memory means a catalog of material handling system elements and rules for connecting said elements;

providing a computer operatively connected to said at least one memory means;

selecting a first material handling system element from said catalog;

selecting a second material handling system element from said catalog;

entering data into said computer including the identity of said first and second selected elements;

executing said set of instructions on said data to display said first and second selected elements connected in accordance with said rules.

6,041,172
MULTIPLE SCALE SIGNAL PROCESSING AND CONTROL SYSTEM

Sunil C. Shah, Mountain View; Pradeep Pandey, San Jose, and Mark A. Erickson, Sunnyvale, all of Calif., assignors to Voyan Technology, Santa Clara, Calif.

Filed Nov. 26, 1997, Appl. No. 980,041

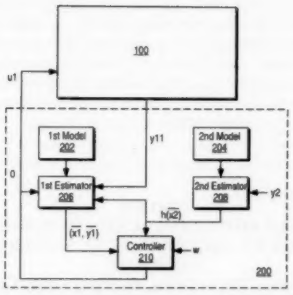
Int. Cl.[7] **G06F** *9/455*

U.S. Cl. 395—500.27 **28 Claims**

1. A method of processing signals generated from a first physical system comprising the steps of:

a) creating a first dynamic model of the first physical system, the first dynamic model being created at a first time scale that consists of a first set of parameters, a first set of states and a first set of inputs;

b) creating a second dynamic model of the first physical system, the second dynamic model being created at a second time scale that consists of a second set of parameters, a second set



of states and a second set of inputs, at least one of the first set of parameters in the first dynamic model being computed from the second set of states in the second dynamic model;

c) creating a second estimator to produce estimates of the second set of states using the second dynamic model, measurements from the first physical system at the second time scale; and

d) creating a first estimator to produce estimates of the first set of states using the first dynamic model, measurements from the first physical system at the first time scale, and the estimates from the second estimator.

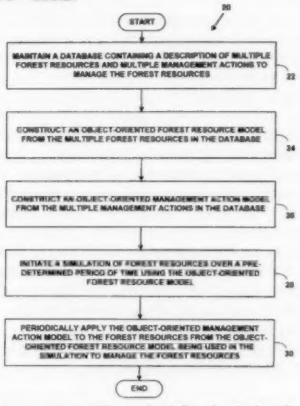
6,041,173
METHOD AND SYSTEM FOR SIMULATING FOREST MANAGEMENT

Richard T. Howard, Portland, Oreg., assignor to Assisi Software Corporation, Portland, Oreg.

Continuation of application No. 08/970,364, Nov. 14, 1997, Pat. No. 5,963,733, Provisional application No. 60/031,826, Nov. 26, 1996. This application Mar. 26, 1999, Appl. No. 280,141.

Int. Cl.[7] **G06G** *7/48*

U.S. Cl. 395—500.27 **9 Claims**


START
20
MAINTAIN A DATABASE CONTAINING A DESCRIPTION OF MULTIPLE FOREST RESOURCES AND MULTIPLE MANAGEMENT ACTIONS TO MANAGE THE FOREST RESOURCES
22
CONSTRUCT AN OBJECT-ORIENTED FOREST RESOURCE MODEL FROM THE MULTIPLE FOREST RESOURCES IN THE DATABASE
24
CONSTRUCT AN OBJECT-ORIENTED MANAGEMENT ACTION MODEL FROM THE MULTIPLE MANAGEMENT ACTIONS IN THE DATABASE
26
INITIATE A SIMULATION OF FOREST RESOURCES OVER A PRE-DETERMINED PERIOD OF TIME USING THE OBJECT-ORIENTED FOREST RESOURCE MODEL
28
PERIODICALLY APPLY THE OBJECT-ORIENTED MANAGEMENT ACTION MODEL TO THE FOREST RESOURCES FROM THE OBJECT-ORIENTED FOREST RESOURCE MODEL BEING USED IN THE SIMULATION TO MANAGE THE FOREST RESOURCES
30
END

1. A computer executable method for simulating forest management, comprising the steps of:

selecting a plurality of TreeClass object-oriented objects to be used with a Stand object-oriented object;

assigning the plurality of TreeClass object-oriented objects to a specific simulated stand within a Stand object-oriented object;

creating a stand model for simulating growing a plurality of simulated trees with the assigned TreeClass object-oriented objects in the specific simulated stand for the Stand object-oriented object;

adding the stand model to an Ownership object-oriented object; and

adding the Ownership object-oriented object with the stand model to an Organization object-oriented object; and

adding the stand model and the Organization object-oriented object to a database, wherein a plurality of stand models and a plurality of Organization object-oriented objects from the database are used to construct an object-oriented forest resource model that is used to make comparisons among a plurality of different Organizations with a plurality of different simulated stand models.

6,041,174

METHOD OF SIMULATING OXIDATION ENHANCED DIFFUSION BY SOLVING PARTIAL DIFFERENTIAL EQUATION

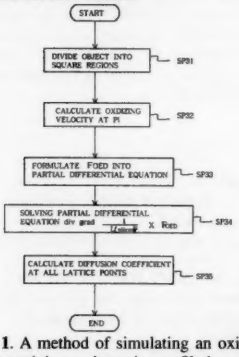
Yutaka Akiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

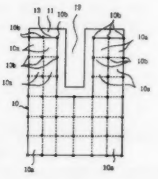
Filed May 28, 1998, Appl. No. 84,912

Claims priority, application Japan, May 29, 1997, 9-139995

Int. Cl.[7] G06F *17/50*

U.S. Cl. 395—500.33 **6 Claims**





1. A method of simulating an oxidation enhanced diffusion for determining an impurity profile in a semiconductor structure, comprising the steps of:

a) preparing a semiconductor structure having a first region of oxidizable material and a second region of oxide;

b) virtually dividing said first region into a plurality of sub-regions;

c) calculating an oxidizing velocity at a boundary between said first region and said second region;

d) formulating an enhanced velocity of diffusion coefficient into a partial differential equation under boundary conditions containing said oxidizing velocity, said enhanced velocity of diffusion coefficient varying a diffusion coefficient in said first region depending upon a length from said boundary;

e) solving said partial differential equation through a conversion into a discrete representation so as to determine said enhanced velocity of diffusion coefficient at nodes in said first region;

f) calculating a variation of a diffusion coefficient on the basis of said enhanced velocity of diffusion coefficient;

g) calculating said diffusion coefficient; and

h) determining an impurity profile in the semiconductor structure based on the diffusion coefficient.

6,041,175

DISPLAY CONTROL METHOD

Taisei Fukada, and Hideto Kohtani, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

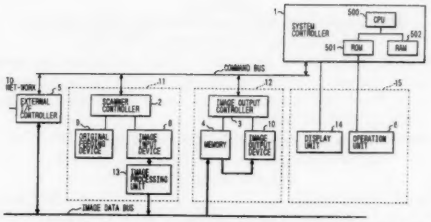
Division of application No. 08/425,792, Apr. 20, 1995, Pat. No. 5,761,480. This application Mar. 17, 1998, Appl. No. 40,007.

Claims priority, application Japan, Apr. 20, 1994, 6-081995; Apr. 20, 1994, 6-082005

Int. Cl.[7] G06F *13/10*

U.S. Cl. 395—500.42 **24 Claims**

1. A control apparatus of a peripheral unit connected to a computer, comprising:



storage means for previously storing a driver program for the peripheral unit which corresponds to a construction of the peripheral unit, said storage means storing a plurality of driver programs corresponding to predicted constructions of the peripheral unit;

detecting means for detecting the construction of the peripheral unit; and

control means for, when said detecting means detects a change in the construction of the peripheral unit, reading the driver program corresponding to a construction after being changed from said storage means and transferring the driver program to the computer.

6,041,176

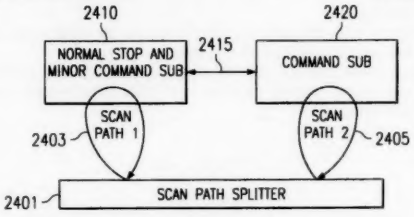
EMULATION DEVICES UTILIZING STATE MACHINES

Jonathan H. Shiell, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 27, 1998, Appl. No. 32,656

Int. Cl.[7] G06F *9/455*

U.S. Cl. 395—500.48 **32 Claims**



1. An emulation device which enables a functional circuit to support self emulation, comprising:

a serial scan testability interface having at least first, second and third scan paths, said first scan path being provided for applying digital information to the functional circuit for use in emulation of the functional circuit;

a first state machine connected to said second scan path having a first state selected from among a first set of states;

a second state machine connected to said said third scan path having a second state selected from among a second set of states;

said emulation device performing an emulation command based on a combined first state of said first state machine and second state of said second state machine.

6,041,177

PROGRAM ANALYZING APPARATUS WHICH CATEGORIZES VARIABLES INTO DOMAINS AND METHOD THEREOF

Keiko Kawabe; Akihiko Matsuo; Minako Kimura; Kenji Nagahashi, and Sanya Uehara, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 12, 1997, Appl. No. 928,501
Claims priority, application Japan, Feb. 26, 1997, 9-042190
Int. Cl.[7] G06F *9/45*
U.S. Cl. 395—704 **12 Claims**

START
ANALYZES ALL EXECUTABLE STATEMENT IN A PROGRAM
PICKS UP AN EXECUTABLE STATEMENT S
S21
S22
SEARCHES VARIABLES BELONGING TO THE SAME DOMAIN OUT OF VARIABLES USED IN THE EXECUTABLE STATEMENT S.
S23
OBTAINS CONCRETE LAYOUT INFORMATION OR THE EXTRACTED VARIABLES SUCH AS PARTIAL REFERENCE POSITION, TYPE AND LENGTH OF THE VARIABLES, AND GRAMMAR RULE.
S24
ADDS THE ABOVE-DESCRIBED LAYOUT INFORMATION TO THE VARIABLE, AND CREATES A NEW DOMAIN GROUPING THEM.
S25
IF THERE IS A SHARED VARIABLE SUCH AS A BUFFER IN A DOMAIN, ATTACHES A MARK *.
S26
CREATES A VARIABLE CATEGORY TABLE T, ADDING A NEW DOMAIN TO A VARIABLE CATEGORY TABLE T (HAVING A DOMAIN LIST). AT THIS TIME, IF THERE IS ANY DOMAIN HAVING THE SAME VARIABLE OR VARIABLE ELEMENT IN THE VARIABLE CATEGORY TABLE T, MERGES IT WITH THE DOMAIN. HOWEVER, IF THE VARIABLE OR ITS ELEMENT IS MARKED WITH *, THEY NOT MERGE.
END
DATA DECLARATION DIVISION
01 A PIC 9(5).
01 B PIC X(4).
01 C PIC X(100).
01 D PIC X(20).
EXECUTABLE STATEMENT S
MOVE A TO B.
MOVE C(50:40) TO D.
SAME DOMAIN VARIABLE (A,B) (C,D)
TYPE INFORMATION
A AND B ARE EXTERNAL DECIMAL NUMBERS.
C AND D ARE ALPHANUMERIC ITEMS.
DIGIT INFORMATION
A: 5 DIGITS, B: 4 DIGITS,
C: 100 DIGITS,
D: 20 DIGITS
GRAMMAR RULE INFORMATION
TRANSCRIPTION FROM A TO B IS RIGHT-JUSTIFIED.
TRANSCRIPTION FROM C TO D IS LEFT-JUSTIFIED.
PARTIAL REFERENCE
40-DIGIT PORTION FROM SIXTH DIGIT OF C IS REFERENCED.
DOMAIN: (A,C),(B,D) (C(50:20),D)
SHARED VARIABLE INFORMATION : D...
DOMAIN: (A,C),(B,D) (C(50:20),D*)
VARIABLE CATEGORY TABLE K
(B,X,Y) (P,D*)
VARIABLE CATEGORY TABLE K'
(A,C),(B,X,Y) (P,D*) (C(50:20),D*)

1. A program analyzing apparatus for analyzing a program and outputting the analysis result of the variables used in the program, comprising:

extracting means for extracting an assignment expression including a plurality of variables from the program:

detecting means for detecting at least one of a range of data which is to be referred by the assignment expression and a range to which data is to be assigned by the assignment expression; and

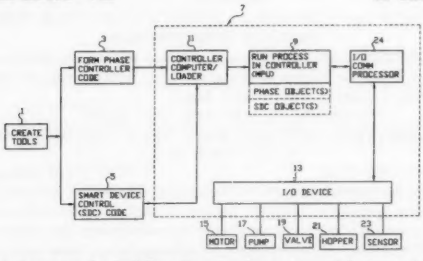
categorizing means for categorizing the plurality of variables according to the range detected by said detecting means.

6,041,178

GRAPHICAL TOOL FOR CREATING DISCRETE PHASE SEQUENCES AND DEVICE CONTROL

David F. Rybarczyk; Lori S. Mar; Christiaan M.H. Mets, all of Phoenix, Ariz., and Xiaojin Xi, Austin, Tex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 4, 1996, Appl. No. 725,746
Int. Cl.[7] G06F *17/00;9/00*
U.S. Cl. 395—705 **21 Claims**



1. A system for building discrete phase sequential steps, which constitute a phase responsible for a discrete task, said system comprising:

a means for creating graphical sequences;

a phase controller code means for converting said graphical sequences into said phase sequential steps;

a smart device control code means for converting said graphical sequences into at least one smart device control code in accordance with said phase sequential steps; and

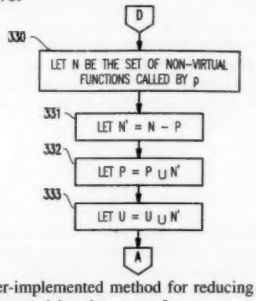
a controller means coupled to said phase controller code means and said smart device control code means for compiling and generating a phase object and a smart device control object for controlling at least one input/output device to perform said discrete task.

6,041,179

OBJECT ORIENTED DISPATCH OPTIMIZATION

David Francis Bacon, New York; Mark N. Wegman, and Frank Kenneth Zadeck, both of Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1996, Appl. No. 723,058
Int. Cl.[7] G06F *13/00*
U.S. Cl. 395—709 **2 Claims**



2. A computer-implemented method for reducing an object oriented program, comprising the steps of:

identifying initial members of a set of live methods and procedures within said program, said initial members comprising methods and procedures that by definition in the program must be executed when the program is run;

identifying initial members of a set of live classes within said program, said initial members comprising classes that must be created when the program is run, based on said initial set of live methods and procedures;

identifying an additional set of live methods and procedures, comprising the additional methods and procedures reachable from the live methods and procedures within said set of live methods and procedures, and adding said additional set to said set of live methods and procedures;

identifying an additional set of live classes, comprising the additional classes potentially creatable by said identified set of additional live methods and procedures;

repeating said steps of identifying an additional set of live methods and procedures and of identifying an additional set of live classes until no further methods or procedures are added to said set of live methods and procedures; and

removing methods and procedures not identified as live.

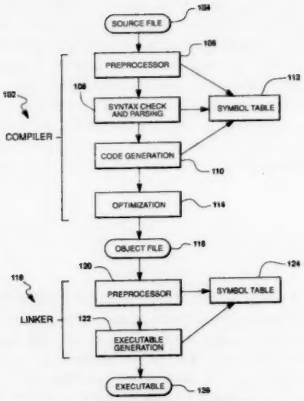
6,041,180

SYSTEM AND METHOD FOR OPTIMIZING TEMPLATE OBJECT FILES

Michael Albert Perks, Austin, and Mark Alvin Sehorne, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1997, Appl. No. 848,629
Int. Cl.[7] G06F *9/45*
U.S. Cl. 395—709 **27 Claims**

1. A method of generating an executable program, comprising the steps of:



compiling one or more source files to generate an object file for each source file, wherein said compiling step includes the step of adding a comment record to each object file;

searching each object file to determine if there are one or more repeated sets of instructions; and

linking the object files together to create an executable module, wherein the executable module contains one copy of each repeated set of instructions.

6,041,181

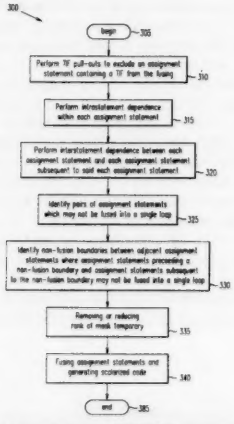
METHOD OF, SYSTEM FOR, AND COMPUTER PROGRAM PRODUCT FOR PROVIDING QUICK FUSION IN WHERE CONSTRUCTS

Dz Ching Ju, Sunnyvale; John Shek-Luen Ng, San Jose, both of Calif., and Vivek Sarkar, Newton, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1997, Appl. No. 899,359

Int. Cl.[7] G06F *9/45*

U.S. Cl. 395—709 **24 Claims**


300
loop
305
Perform 'IF' pull-outs to exclude an assignment statement containing a 'IF' from the loop
310
Perform intrastatement dependence within each assignment statement
315
Perform interstatement dependence between each assignment statement and each assignment statement subsequent to said each assignment statement
320
Identify pairs of assignment statements which may not be fused into a single loop
325
Identify non-fusion boundaries between adjacent assignment statements where assignment statements preceding a non-fusion boundary and assignment statements subsequent to the non-fusion boundary may not be fused into a single loop
330
Removing or reducing rank of mask temporary
335
Fusing assignment statements and generating scalarized code
340
end
345

1. A method of translating a WHERE construct, containing a plurality of assignment statements, in a source program, said method comprising the steps of:

identifying a first subset of the plurality of assignment statements, the first subset comprising a pair of assignment statements which may not be fused into a single loop, by storing an indication of the pair of assignment statements in a three dimensional data structure, wherein:

a first dimension corresponds to a first assignment statement of the pair of assignment statements;

a second dimension corresponds to a second assignment statement of the pair of assignment statements;

a third dimension corresponds to a loop level at which the pair of assignment statements may not be fused into a single loop; and

the indication is indexed by the first assignment statement, the second assignment statement, and the loop level;

responsive to the identifying of the first subset, identifying a second subset of the plurality of assignment statements which may be fused into a single loop; and

responsive to the identifying of the second subset, fusing the second subset of the plurality of assignment statements into a single loop.

6,041,182

AUTOMATIC INVOCATION OF COMPUTATIONAL RESOURCES WITHOUT USER INTERVENTION

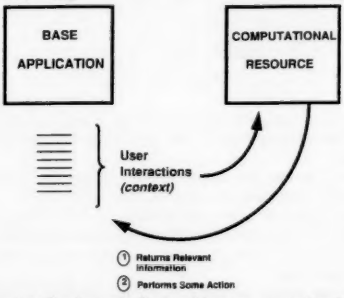
Peter Hart, Menlo Park, and Jamey Graham, San Jose, both of Calif., assignors to Ricoh Company Ltd, Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Continuation of application No. 08/034,458, Mar. 19, 1993, Pat. No. 5,546,502. This application May 24, 1996, Appl. No. 653,601.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *9/445*

U.S. Cl. 395—712 **44 Claims**



1. A system for dynamically invoking a computational resource for a user comprising:

means for operating for the user a base application such that the computational resource is external to the base application;

means for receiving into the base application a series of user interactions which establish a context; and

means for in response to the series of user interactions dynamically instructing, responsive to the context, the computational resource to perform selected computational operations, said system integrated within a single computer.

6,041,183

REMOTE MAINTENANCE SYSTEM AND METHOD FOR COMPUTER PERIPHERALS

Takeshi Hayafune, Hiratsuka; Kouichiro Maemura, Isehara, and Takahito Miura, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

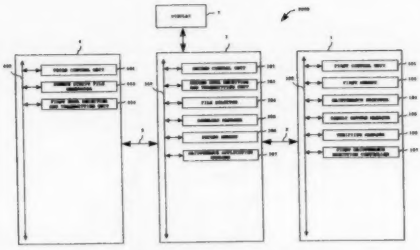
Filed Sep. 17, 1997, Appl. No. 932,210

Claims priority, application Japan, Sep. 17, 1996, 8-244366

Int. Cl.[7] G06F *9/445*

U.S. Cl. 395—712 **130 Claims**

125. A computer for performing remote maintenance on a computer peripheral, the computer peripheral coupled to the computer and including a first memory for storing maintenance data including identification information for identifying the computer peripheral and programmed parameters for adjusting an operating condition of the computer peripheral, the computer communicating information from a remote maintenance provider's site to the computer peripheral, said computer comprising:



a data receiver and transmitter for receiving a source script file sent from the remote maintenance provider's site and for transmitting data to said at least one computer peripheral;

a selector for selecting an instruction for a model of said computer peripheral connected to said computer from among instructions included in said source script file and for generating a model-specific script file including said selected instruction;

a second memory for storing said model-specific script file;

a download manager for downloading said model-specific script file including said selected instruction into said second memory; and

maintenance application executor for executing at an arbitrary time a maintenance application for transmitting said downloaded model-specific script file to said computer peripheral after said model-specific script file is downloaded into said second memory.

6,041,184

CAMERA HAVING A VISUAL LINE DETECTION DEVICE

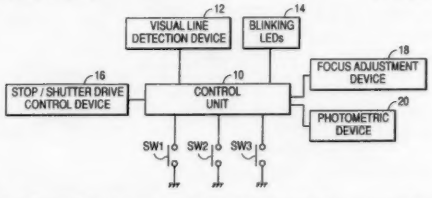
Hideya Inoue, Yokohama, and Masami Takemoto, Urawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of application No. 08/691,382, Aug. 2, 1996, abandoned, which is a continuation of application No. 08/305,740, Sep. 14, 1994, abandoned, which is a continuation of application No. 08/141,994, Oct. 28, 1993, abandoned. This application Mar. 19, 1997, Appl. No. 820,548.

Claims priority, application Japan, Oct. 30, 1992, 4-293379

Int. Cl.[7] G03B *17/00*

U.S. Cl. 396—51 **68 Claims**



1. A camera having a visual line detection device, comprising:

an input unit to input calibration information related to an eye of a photographer;

a calculation unit to calculate a visual line of the photographer based upon the calibration information and a state of the eye of the photographer;

a setting unit to set photographic conditions based upon the calculated visual line;

a photographic unit to execute photographic processes in response to a release operation; and

a priority operation execution unit to actuate the photographic unit when a release operation is performed during input of calibration information.

6,041,185

CAMERA WITH REMOTE-CONTROL PHOTOGRAPHY AND STROBOSCOPIC PHOTOGRAPHY FUNCTION

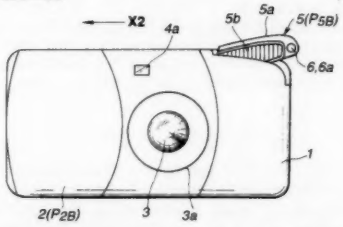
Tatsuya Suzuki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jan. 27, 1999, Appl. No. 238,276

Claims priority, application Japan, Jan. 28, 1998, 10-016183

Int. Cl.[7] G03B *15/03*

U.S. Cl. 396—56 **7 Claims**



1. A camera with a remote-control photography function, comprising:

a strobe light unit having a strobe light mounted in a side thereof; and

a light receiving unit, mounted in said strobe light unit, for receiving remote-control light signals.

6,041,186

FINDER SYSTEM

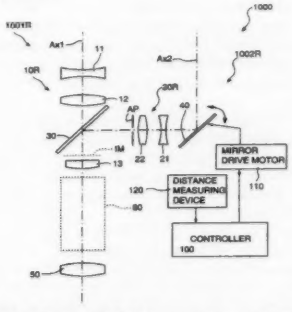
Takayuki Sensui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaish, Tokyo, Japan

Filed May 27, 1998, Appl. No. 84,735

Claims priority, application Japan, May 27, 1997, 9-152974; May 27, 1997, 9-152975; May 27, 1997, 9-152976; May 27, 1997, 9-152977; May 27, 1997, 9-152978; May 27, 1997, 9-152979

Int. Cl.[7] G03B *13/04;13/16;13/36*

U.S. Cl. 396—80 **58 Claims**



1. A finder system provided in a camera separately from a photographing optical system, comprising:

a first objective optical system for forming a first image of an object, said first image being a real image;

a second objective optical system for forming a second image of said object, said second image being a real image, said first and second objective optical systems being spaced from each other by a predetermined base length;

a light combining element that combines light passing through said first objective optical system and a part of light passing through said second objective optical system to superimpose a part of said second image with said first image within a field of view;

an erecting optical system for erecting said first image and said part of said second image combined by said light combining element;

an eyepiece optical system that directs light passing through said light combining element toward an eye of an observer;

a light deflecting device that deflects a path of light emerging from said second objective optical system to change degree of coincidence of said part of said second image with respect to said first image along a direction of said base length;

a passive distance measuring device for detecting a distance to said object, the passive distance measuring device including a pair of imaging lenses having optical axes that extend in parallel, optical paths of said pair of imaging lenses being different than optical paths of the first and second objective optical systems; and

a controller which controls said light deflecting device such that said part of said second image and said first image of an object which is located at said distance detected by said active distance measuring device coincide with each other.

6,041,187

POWER TRANSMISSION APPARATUS

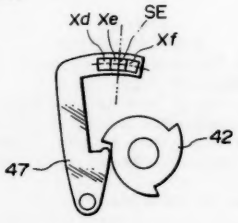
Yoichiro Okumura, Hino; Michio Nagai, Hamura; Hiroshi Terada, Mitaka, and Atsushi Maruyama, Machida, all of Japan, assignors to Olympus Optical Co., Ltd.

Division of application No. 08/234,662, Apr. 28, 1994, abandoned. This application Dec. 2, 1996, Appl. No. 759,033.

Claims priority, application Japan, Apr. 30, 1993, H5-128029; Apr. 30, 1993, H5-128030; Apr. 30, 1993, H5-128031; May 19, 1993, H5-117184

Int. Cl.[7] **G03B** *1/18*

U.S. Cl. 396—132 **1 Claim**



1. A clutch mechanism comprising:

a planetary gear for transmitting power of a driving source;

an engaging element for regulating revolution of said planetary gear at a plurality of predetermined engaging positions;

detecting means for detecting a position of said engaging element; and

a section to be detected provided on said engaging element, for providing a unique output value to said detecting means, only when said planetary gear is in an initial position which output value is different from output values obtained at a plurality of engaging positions of said planetary gear other than said initial position;

said section to be detected comprising a region which has at least one of three different transmissivities,

three different reflectance factors and three different distances to be detected, with respect to a detecting portion of said detecting means to thereby identify a position of the engaging means.

6,041,188

MULTI-POSITION FLASH WITH SHUTTER ACTUATOR OPERABLE IN EACH POSITION ON COMPACT CAMERA

Robert G. Capurso, Bergen, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

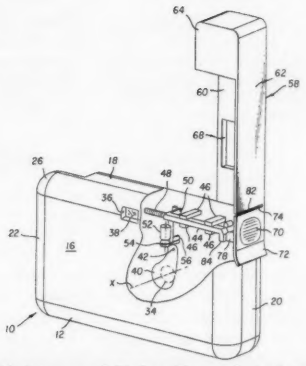
Filed May 13, 1998, Appl. No. 78,068

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G03B** *15/03;17/38;* **H04N** *5/225*

U.S. Cl. 396—178 **11 Claims**

11. A method of actuating a shutter blade to uncover a taking lens in order to take a picture in a camera having a dual position



flash pivotable between a folded position against a housing and an unfolded position extending from the housing, comprising the steps of:

moving the flash to its folded position;

manually depressing a shutter actuator on the flash, for actuation of the shutter blade with the flash in the folded position;

moving the flash to its unfolded position; and

manually depressing the shutter actuator on the flash, for actuation of the shutter blade with the flash in the unfolded position.

6,041,189

CAMERA SYSTEM, CAMERA AND CAMERA-ACCESSORY

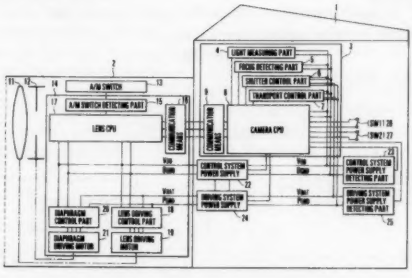
Kazuhiro Izukawa, Misato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1998, Appl. No. 128,650

Claims priority, application Japan, Aug. 25, 1997, 9-241689; Sep. 11, 1997, 9-247038

Int. Cl.[7] **G03B** *7/26*

U.S. Cl. 396—277 **38 Claims**



1. A camera system composed of a camera capable of containing a battery therein and an accessory capable of being detachably mounted on said camera and being supplied with electric power from said camera, communication being possible between communication means of said camera and communication means of said accessory, said accessory, upon receiving an instruction from said camera, performing an operation according to the received instruction, said camera system comprising:

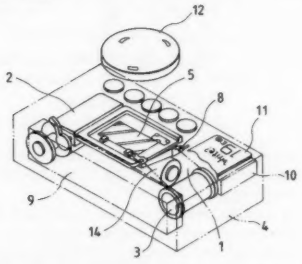
a circuit which sends an instruction designating a value corresponding to electric power usable by said accessory from said camera to said accessory, to decide a working power or voltage usable in said accessory selected from among a plurality of working powers or voltages.

6,041,190

IMAGE DISPLAY APPARATUS

Hiroshi Kikuchi, Zushi, and Takayuki Tsuboi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1997, Appl. No. 866,860
Claims priority, application Japan, Jun. 4, 1996, 8-162453
Int. Cl.[7] G03B *21/00;* **G02B** *27/02*
U.S. Cl. 396—284 **26 Claims**



1. An image display apparatus for displaying an image recorded on a film, comprising:

a) a spatial light modulation device which can maintain a recorded image in a non-energization state;

b) an illumination device for illuminating said spatial light modulation device with light;

c) a moving mechanism for moving said spatial light modulation device and said illumination device to one of a first state in which said film is located between said spatial light modulation device and said illumination device and a second state in which said film is not located between said spatial light modulation device and said illumination device; and

d) a control circuit for moving said spatial light modulation device and said illumination device to said first state when an image recorded on said film is to be recorded on said spatial light modulation device, and moving said spatial light modulation device and said illumination device to said second state when said spatial light modulation device on which the image is recorded is to be observed.

6,041,191

PHOTOGRAPHIC CAMERA SYSTEM

Takahiko Saito, Kanagawa; Akira Nakanishi, Tokyo; Shunzi Obayashi, Tokyo; Kyoji Genda, Tokyo, and Hideki Toshikage, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of application No. 08/958,839, Oct. 28, 1997, Pat. No. 5,978,067, which is a division of application No. 08/645,030, May 15, 1996, Pat. No. 5,721,991, which is a division of application No. 08/426,113, Apr. 20, 1995, Pat. No. 5,570,147, which is a division of application No. 08/333,593, Nov. 2, 1994, Pat. No. 5,625,430, which is a continuation of application No. 08/026,415, Mar. 4, 1993, abandoned. This application Apr. 21, 1999, Appl. No. 295,863.
Claims priority, application Japan, Mar. 17, 1992, 4-060684; Mar. 23, 1992, 4-065304
This patent is subject to a terminal disclaimer.
Int. Cl.[7] G03B *17/24*
U.S. Cl. 396—311 **8 Claims**

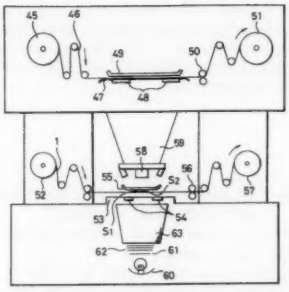
1. A photographic film printer for printing an image in an exposure area of a processed photographic film onto photosensitive paper, the photographic printer comprising:

a printer body;

a light source and a variable-width mask for exposing the photosensitive paper;

film feed means disposed on the printer body for feeding the processed photographic film;

detecting means disposed on the printer body for non-mechanically detecting in a marginal area of the processed photographic film a frame number signal and an aspect signal to be used in printing the image;



control means disposed on the printer body and connected to the film feed means for controlling driving of the processed photographic film and for judging whether the detected aspect signal is correct or not; and

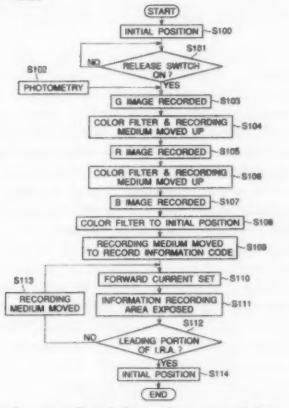
printing means disposed on the printer body for varying an opening width of the variable-width mask used to expose the image in the exposure area of the processed photographic film on the photosensitive paper based on the judged aspect signal.

6,041,192

INFORMATION RECORDING DEVICE

Yasuhiro Yamamoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1997, Appl. No. 829,186
Claims priority, application Japan, Apr. 2, 1996, 8-104534
Int. Cl.[7] G03B *17/24;17/48;29/00*
U.S. Cl. 396—315 **13 Claims**



1. A device for recording information, comprising:

an electro-developing recording medium by which an image formed thereon is electronically developed, said electro-developing recording medium having an image recording area, in which an object image is recorded, said image recording area comprising a primary image recording area for each of a plurality of primary color images and an information recording area, in which information other than said object image is recorded;

a positioning mark recording processor that records positioning marks for each of said primary image recording areas in said information recording area, and records information related to an object image in said information recording area, said positioning marks being adapted for adjusting a relative position of each of said primary color images said related information being recorded by repeatedly turning ON and OFF a light beam emitted by a light source; and

a moving mechanism that moves one of said electro-developing recording medium and a light source in a predetermined direction, said positioning mark recording processor recording said related information while said one of said electro-developing recording medium and said light source is moved by said moving mechanism.

6,041,193

REAL-IMAGE ZOOM FINDER WITH ROTATIONALLY ASYMMETRIC SURFACE

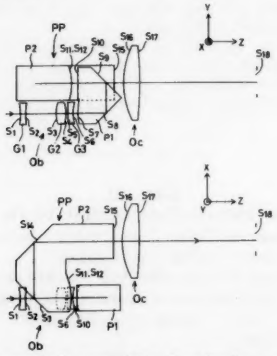
Norihiko Aoki, Iino-machi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1998, Appl. No. 118,383

Claims priority, application Japan, Jul. 18, 1997, 9-194254

Int. Cl.[7] G03B *17/10*

U.S. Cl. 396—379 **23 Claims**



1. A real-image finder comprising, in order from an object side thereof:

an objective optical system having a positive refracting power;

an image-inverting optical system having a reflecting surface, said image-inverting optical system erecting an intermediate image formed by said objective optical system; and

an ocular optical system having a positive refracting power;

wherein said objective optical system includes, in order from an object side thereof, a first lens unit having a negative refracting power, a second lens unit having a positive refracting power, and a third lens unit having one of a positive refracting power and a negative refracting power,

wherein when zooming from a wide-angle end to a telephoto end is performed, a spacing between each pair of lens units among said first, second and third lens units is changed, and

wherein said reflecting surface of said image-inverting optical system is arranged in a form of a curved reflecting mirror having an optical power and having a rotationally asymmetric surface configuration that corrects decentration aberrations produced by said curved reflecting mirror.

6,041,194

POSITION ADJUSTING DEVICE

Yasuhiro Yamamoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

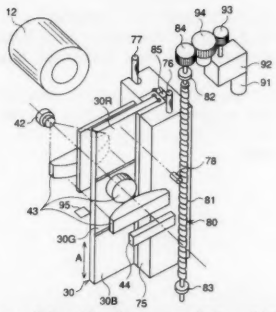
Filed Apr. 17, 1997, Appl. No. 842,876

Claims priority, application Japan, Apr. 18, 1996, P08-121110

Int. Cl.[7] G03B *19/00*

U.S. Cl. 396—429 **20 Claims**

1. A device for adjusting a position of an electro-developing recording medium in which an object image formed by a photographing optical system is electronically developed, said electro-developing recording medium having a plurality of recording areas in which color images corresponding to said object image are



sequentially recorded, said color images being obtained by color separating a color image into a plurality of primary color images, said device comprising:

a recording medium moving mechanism which moves said electro-developing recording medium to a position where one of said recording areas is positioned in an optical path of the photographing optical system; and

an adjusting mechanism which adjusts a position of said electro-developing recording medium so that a relative position of each of said color images formed by said photographing optical system with respect to each of said recording areas is substantially the same.

6,041,195

CAMERA CAPABLE OF VIDEO AND FILM SHOOTING HAVING OPTICAL VIEWFINDER

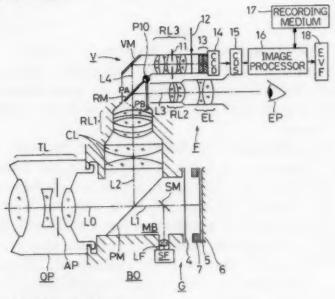
Tsutomu Honda, Sakai; Hiroyuki Matsumoto, Wakayama, and Tatsuya Suzuki, Kawachinagano, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jul. 24, 1997, Appl. No. 899,800

Claims priority, application Japan, Jul. 24, 1996, 8-194651; Jul. 24, 1996, 8-194657

Int. Cl.[7] G03B *17/48;19/00;29/00*

U.S. Cl. 396—429 **7 Claims**



1. A camera comprising,

a switching member for switching a subsequent path of a light flux having passed through a taking lens between a direction in which the light flux continues to travel as a first light flux and another direction in which the light flux continues to travel as a second light flux;

a light flux splitting member for splitting said second light flux into a third light flux and a fourth light flux;

a first shooting system that performs shooting by receiving one of said first, third, and fourth light fluxes;

a second shooting system that performs shooting by receiving one of said first, third, and fourth light fluxes except the one that is directed to said first shooting system; and

a viewfinder optical system that receives one of said first, third, and fourth light fluxes except the ones that are directed to said first and second shooting systems.

6,041,196

DEVELOPER DETECTING APPARATUS FOR DETECTING THE POSITION OF AN UPPER SURFACE OF DEVELOPER CONTAINED IN A CONTAINER AND PROCESS CARTRIDGE COMPRISING SUCH APPARATUS

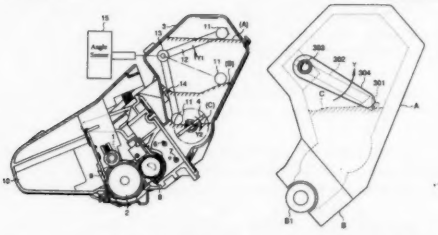
Takao Nakagawa, Numazu, and Tadayuki Tsuda, Susono, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1998, Appl. No. 178,502

Claims priority, application Japan, Oct. 27, 1997, 9-293967; Oct. 29, 1997, 9-296983; Dec. 11, 1997, 9-341705

Int. Cl.[7] G03G *15/08*

U.S. Cl. 399—27 **17 Claims**



12. An apparatus for detecting an amount of developer, including:

a detection member for detecting a position of an upper surface of developer contained in a developer container, wherein a leading end of said detection member is substantially in the form of a triangular column.

6,041,197

CHARGING DEVICE

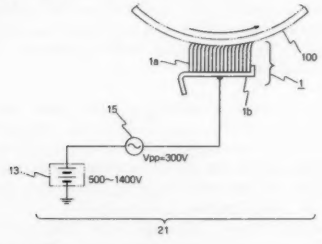
Mabumi Kashihara, Niigata, Japan, assignor to NEC Corporation, Japan

Filed Jan. 28, 1999, Appl. No. 239,397

Claims priority, application Japan, Jan. 30, 1998, 10-018733

Int. Cl.[7] G03G *15/02*

U.S. Cl. 399—50 **10 Claims**



1. A charging device comprising:

an electric charger that is in contact with an electrostatic latent image carrier and applies a predetermined voltage to said electrostatic latent image carrier; and

a power source consisting of a DC power source and an AC power source for applying a DC voltage in combination with an AC voltage to said electric charger,

wherein said AC voltage has a frequency corresponding to a level of half-tone of a latent image to be formed on said electrostatic latent image carrier.

6,041,198

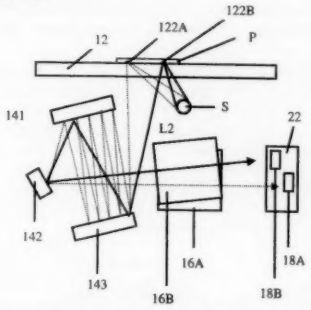
DUAL RESOLUTION SCANNER

Philip L. Chen, E. Rolling Hills, Calif., assignor to Avision Inc., Hsin-Chu, Taiwan

Filed Jun. 24, 1998, Appl. No. 104,246

Int. Cl.[7] G03G *15/043;15/04*

U.S. Cl. 399—51 **9 Claims**



1. A dual resolution scanner for scanning a document, comprising

a frame for housing said scanner;

a light source for focusing a light beam on said document at one of two spots,

a first spot of said two spots being closer to said light source and more focused than a second spot of said two spots;

a first set of sensors for sensing first light ray reflected from said first spot;

a second set of sensors for sensing second light ray reflected from said second spot and displaced from said first set of sensors and

means for advancing and scanning said document at a slower speed when said first spot is focused than when said second spot is focused.

6,041,199

IMAGE FORMATION APPARATUS WITH SHEET STACKING CONTROL FEATURE

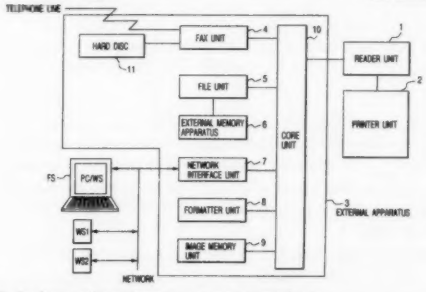
Yoshimasa Kashimada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1997, Appl. No. 994,432

Claims priority, application Japan, Dec. 25, 1996, 8-357411

Int. Cl.[7] G03G *15/00;* **H04N** *1/00*

U.S. Cl. 399—82 **11 Claims**



1. An image formation apparatus comprising:

input means for inputting an image and instructions from an external apparatus connected to said image formation apparatus;

image formation means for forming the image, inputted by said input means, on a sheet;

stacking means for stacking the sheets on which the images have been formed by said image formation means on a stacking unit;

detection means for detecting that a stacked sheet is present on said stacking unit; and

control means for inhibiting the sheet stacking onto said stacking means if said input means does not input the instructions and said detection means detects the stacked sheet, and allowing the sheet stacking onto said stacking unit on which the sheet has already been stacked, if said input means inputs the instructions and said detection means detects the stacked sheet.

6,041,200

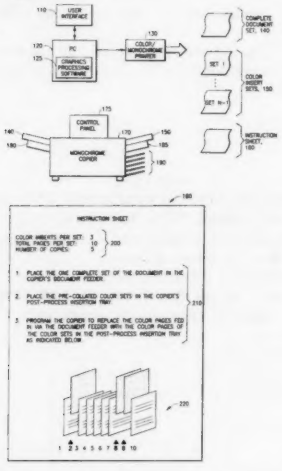
METHOD AND APPARATUS FOR SPLIT PRINTING OF COLOR AND MONOCHROME DOCUMENTS

William H. Glass, Edina; Mark Lokhorst, Eden Prairie; Philip A. Lodwick, Richfield, and Loren Schoenzeit, Orono, all of Minn., assignors to Electronics for Imaging, Inc., Foster City, Calif.

Filed Mar. 8, 1999, Appl. No. 264,287

Int. Cl.[7] G03G *15/00;21/00*

U.S. Cl. 399—82 **15 Claims**



1. A method for providing N sets of documents using a printer and a copier, where $N \geqq 1$, and each set of documents includes a first type of sheets, and a second type of sheets provided in a particular sequence in relation to the first type of sheets, comprising the steps of:

printing a first complete document set, including the first and second types of sheets;

printing N−1 insert sets of the second type of sheets;

printing an instruction sheet indicating the particular sequence;

positioning the first complete document set in a document feeder of the copier;

positioning the N−1 insert sets in a post-process insertion tray of the copier; and

programming the copier according to the instruction sheet to identify the particular sequence.

6,041,201

APPARATUS FOR FILTERING SOLVENT OF LIQUID ELECTROPHOTOGRAPHIC PRINTER

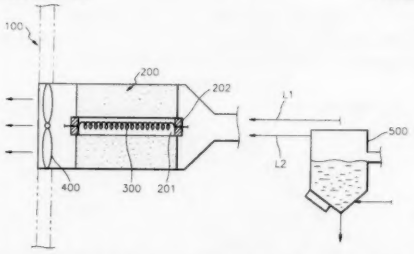
Jong-Woo Kim, Yongin, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 5, 1999, Appl. No. 262,847

Claims priority, application Rep. of Korea, Mar. 6, 1998, 98-7521

Int. Cl.[7] G03G *21/20*

U.S. Cl. 399—93 **4 Claims**



1. An apparatus for filtering a solvent of a liquid electrophotographic printer, said apparatus comprising:

an exhaust fan for exhausting air inside a main body of said printer to the outside thereof;

a platinum catalyst filter installed on a flow route of air exhausted by said exhaust fan for filtering solvent included in the exhausted air; and

a heater for selectively heating said platinum catalyst filter, wherein a hollow cylinder is formed in said platinum catalyst filter and said heater is installed in said hollow cylinder.

6,041,202

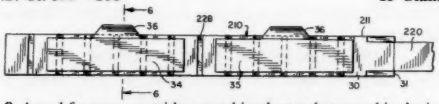
SEAL FOR TONER CARTRIDGE

Lester Cornelius, 47-00 33rd St., Long Island City, N.Y. 11101

Provisional application No. 60/091,226, Jul. 6, 1998. This application Jul. 6, 1999, Appl. No. 347,722.

Int. Cl.[7] G03G *15/08*

U.S. Cl. 399—106 **15 Claims**



9. A seal for toner cartridges used in electrophotographic devices comprising a strip of fibrous non-woven material having a principal axis in which the fibers are axially aligned and lightly fused within a synthetic resinous film; said strip including transversely oriented areas of relatively greater fusion at periodic intervals along said principal axis.

6,041,203

PROCESS UNIT, PHOTOSENSITIVE MEMBER CARTRIDGE, DEVELOPER CARTRIDGE, AND IMAGE FORMING APPARATUS

Tsutomu Suzuki, Nagoya; Shougo Sato, Seto, and Yasushi Okabe, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 31, 1999, Appl. No. 281,948

Claims priority, application Japan, Feb. 26, 1999, 11-050232

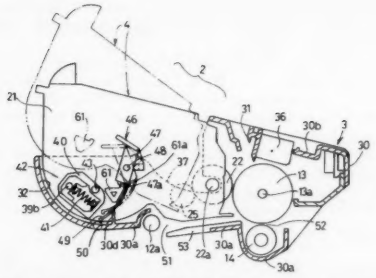
Int. Cl.[7] G03G *15/00;21/18*

U.S. Cl. 399—111 **29 Claims**

1. A process unit for use with developer, comprising:

a photosensitive member cartridge having a photosensitive member on which an electrostatic latent image is formed and an accommodating portion;

a developer cartridge having a developing roller that supplies the developer to the photosensitive member, the developer car-



tridge is separate from and fittingly set into an accommodating portion of the photosensitive member cartridge;

an urging device provided at the photosensitive member cartridge so as to urge the developing roller relative to the photosensitive member; and

an action-receiving portion provided at the developer cartridge so as to communicate with the urging device.

6,041,204

COLOR IMAGE FORMING APPARATUS WITH AN ORGANIC PHOTOCONDUCTOR

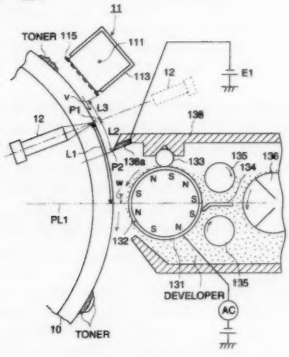
Satoshi Haneda; Hiroyuki Tokimatsu; Masahiro Onodera, and Shuta Hamada, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 30, 1998, Appl. No. 223,701

Claims priority, application Japan, Jan. 7, 1998, 10-001494; Jan. 21, 1998, 10-009603

Int. Cl.[7] **G03G** *15/00*

U.S. Cl. 399—159 **9 Claims**



1. A color image forming apparatus, comprising:

an image forming member having a rotatable peripheral surface on which an organic photoconductor is provided;

plural sets of charging means, imagewise exposure means, and developing means, the charging means charging the peripheral surface of the image forming member, the imagewise exposure means imagewise exposing a portion of the peripheral surface at an imagewise exposing position so as to form a latent image and the developing means developing the image at a developing position so as to form a toner image on the peripheral surface;

wherein each set of the plural sets is provided separately from other sets around the peripheral surface of the image forming member so that plural color component images are formed one after another by the plural sets and are superimposed so as to form a color image on the peripheral surface during a single rotation of the peripheral surface, and

wherein the developing means has a casing and the imagewise exposure means and the developing means of each set are arranged such that the portion on the peripheral surface located at the imagewise exposing position moves into the casing of the developing means before the electric-potential of the portion is lowered to half of **V1** (**V1/2**), where **V1** is the electric potential on the peripheral surface located at the imagewise exposing position.

6,041,205

IMAGE PROCESSING APPARATUS FOR LAYING OUT PLURALITY OF IMAGES IN CONFORMITY WITH IMAGE ORIENTATION

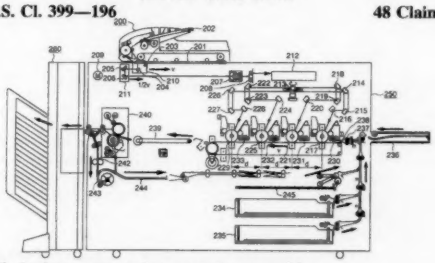
Masahiro Funada, and Yukari Toda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1997, Appl. No. 881,274

Claims priority, application Japan, Jun. 25, 1996, 8-164632; Jun. 28, 1996, 8-169912

Int. Cl.[7] **G03G** *21/00*

U.S. Cl. 399—196 **48 Claims**



1. An image processing apparatus comprising:

input means for inputting a document image;

first detecting means for detecting orientation of the document image that has been input by said input means;

second detecting means for detecting size of the document image that has been input by said input means; and

image processing means for reducing the document image that has been input by said input means, at a magnification according to detection results obtained by said first and second detecting means, and arranging a plurality of document images as a single image.

6,041,206

SQUEEZE ROLLER ELEVATING APPARATUS OF LIQUID ELECTROPHOTOGRAPHIC PRINTER

woo-yong Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 7, 1999, Appl. No. 307,029

Claims priority, application Rep. of Korea, May 8, 1998, 98-16505; Sep. 15, 1998, 98-37925

Int. Cl.[7] **G03G** *15/10*

U.S. Cl. 399—249 **2 Claims**

1. A squeeze roller elevating apparatus of a liquid electrophotographic printer for selectively pressing a photoreceptor belt, which is installed at a belt frame for circulation, by elevating a squeeze roller, said apparatus comprising:

a housing fixed at the belt frame;

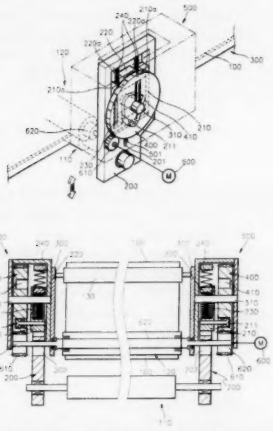
a squeeze frame installed in said housing and operative to elevatingly support the squeeze roller;

a first elevating member installed at said squeeze frame for elevating movement;

a second elevating member installed at said squeeze frame for elevating movement by being interlocked with the elevating movement of said first elevating member and moving said squeeze frame upward so that the squeeze roller presses the photoreceptor belt while ascending;

a first spring coupling said first elevating member and said second elevating member to be interlocked with one another;

a second spring coupling said second elevating member and said squeeze frame to be interlocked with one another; and



an elevator which elevates said first elevating member.

6,041,207

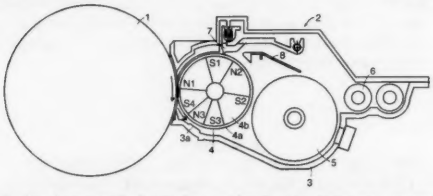
APPARATUS FOR CONTROLLING THE MOVEMENT OF MAGNETIZED DEVELOPER MATERIAL IN A LATENT, ELECTROSTATIC IMAGE DEVELOPING DEVICED

Yasuyuki Ishiguro, Higashiosaka; Yoshiaki Sanada, Ikoma; Toshihiko Takaya, Yamatokoriyama; Takahiko Kimura; Masatoshi Kaneshige, both of Ikoma, and Shuuhei Yamamoto, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1998, Appl. No. 140,704

Int. Cl.[7] G03G *15/09*

U.S. Cl. 399—275 **7 Claims**



1. An electrostatic latent image developing apparatus comprising:

a developer tank defining an interior adapted for containing toner particles and magnetized carrier particles, and for imparting an electrostatic charge to at least some of said toner particles;

a hollow, cylindrical developing sleeve, said developing sleeve being rotatably drivable about its longitudinal axis in a first direction, and defining an outer surface in communication with said interior of said developer tank at, at least a first location;

an electrostatic latent image bearing member defining a surface adapted to have an electrostatic latent image formed thereon, said surface being closely spaced to said outer surface of said developer sleeve at a second location substantially opposite to said first location;

a stationary magnet fixedly disposed inside said rotatable developing sleeve, said magnet defining a number of magnetic poles circumferentially spaced about the longitudinal axis of said developing sleeve;

said magnetic poles including:

a developing magnetic pole having a first polarity located substantially adjacent to said second location;

a developer separating magnetic pole and a developer sucking magnetic pole both having the same second polarity, opposite to said first polarity, located circumferentially adjacent to one another, with said developer sucking magnetic pole being located downstream in said first direction from said developer separating magnetic pole substantially adjacent to said first location;

a first even number of intermediate magnetic poles of alternating polarities located in circumferentially spaced relation to one another between said developing magnetic pole and said separating magnetic pole such that the polarity of said first even number of intermediate magnetic poles alternates between said second polarity and said first polarity in said first direction between said developing magnetic pole and said developer separating magnetic pole, and

a second even number of intermediate magnetic poles of alternating polarity located in circumferentially spaced relation to one another such that the polarity of said second even number of magnetic poles alternates between said first polarity and said second polarity in said first direction between said sucking magnetic pole and said developing magnetic pole; and

a doctor element for limiting the thickness of said layer of developer layer carried by said sleeve, wherein said doctor element is adapted to interact with a of developer located on said developer sleeve approximately midway between a pair of said second even number of alternating polarity magnetic poles located between said developer sucking magnetic pole and said developing magnetic pole;

wherein the speed of rotation of said developer sleeve, and the spacing, magnitude and direction of the magnetic force provided by said magnetic poles are selected such that (1) the rise of developer magnetically adhered to said surface of said developing sleeve is small between adjacent magnetic poles; (2) said developer undergoes a chain-like rotation on said surface of said developer sleeve upon passing each of said magnetic poles; (3) toner is transferred from said developer on the surface of said developer sleeve to said latent image bearing member at said second location when said latent image bearing member has an electrostatic image formed thereon; and (4) the area of said developer having the weakest charge abuts said developer sleeve surface in the vicinity of said developer separating magnetic pole.

6,041,208

METHOD AND ARRANGEMENT FOR RETRIEVING/SUPPLYING DEVELOPING MATERIAL IN ELECTROPHOTOGRAPHY FORMING APPARATUS

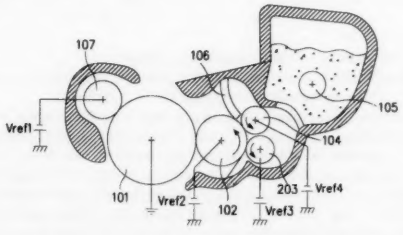
Bong-Hwan Choi, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 7, 1998, Appl. No. 55,922

Claims priority, application Rep. of Korea, Apr. 7, 1997, 97-12638

Int. Cl.[7] G03G *15/08*

U.S. Cl. 399—281 **15 Claims**



1. A method for retrieving and supplying developing material in an electrophotography forming apparatus which includes a developing roller, a retrieval roller and a supply roller, said method comprising the steps of:

rotating said retrieval roller adjacent to said developing roller in a direction identical to a direction of rotation of said developing roller; and

applying voltages to said developing roller, said retrieval roller and said supply roller according to following expression:

Vr>Vd>Vs

where

Vr is the voltage applied to the retrieval roller,

Vd is the voltage applied to the developing roller, and

Vs is the voltage applied to the supply roller.

6,041,209

CHARGING MEMBER HAVING AN ELASTOMERIC MEMBER INCLUDING AN ELASTOMERIC MATERIAL HAVING A DOUBLE OXIDE

Jun Murata, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

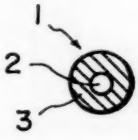
Continuation of application No. 08/208,038, Mar. 9, 1994, Pat. No. 5,757,508, which is a continuation of application No. 07/492,583, Mar. 13, 1990, abandoned. This application Apr. 24, 1998, Appl. No. 63,725.

Claims priority, application Japan, Mar. 14, 1989, 1-061336

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G03G *15/02;15/16*

U.S. Cl. 399—313 **36 Claims**



1. A charging member comprising an elastomeric member comprising an elastomeric material, the elastomeric material having a double oxide contained therein, said double oxide being a solid solution compound of oxides of at least two different metals formed by crystal lattice substitution, wherein said at least two different metals have different valences, whereby said double oxide has an electroconductivity that is larger than that of either one of said oxides of at least two different metals when not in solution.

6,041,210

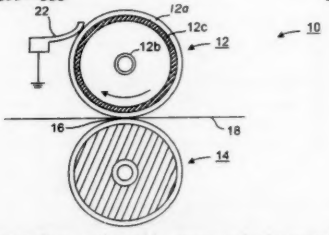
ELECTROSTATIC CHARGE-SUPPRESSING FUSER ROLLER

Jiann H. Chen, Fairport; Robert A. Lancaster, Hilton, both of N.Y.; Andy H. Tsou, Houston, Tex., and Charles C. Anderson, Penfield, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application No. 09/123,204, Jul. 27, 1998, abandoned. This application Jun. 17, 1999, Appl. No. 335,371.

Int. Cl.[7] G03G *15/20*

U.S. Cl. 399—333 **11 Claims**



1. A toner fuser roller with suppressed electrostatic charge build-up for fixing a toner image to a receiver comprising:

(a) a core; and

(b) an overcoat layer formed over the core and defining the surface that contacts the receiver, such overcoat layer including electrically conductive fine powder having a weight percentage between about 30 to 80 weight percent so as to make the overcoat layer electrically conductive and suppress electrostatic charge build-up and improve thermal conductivity.

6,041,211

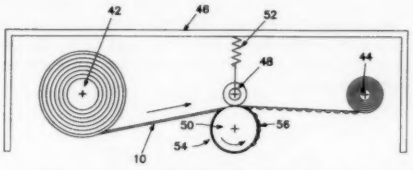
CLEANING ASSEMBLY FOR CRITICAL IMAGE SURFACES IN PRINTER DEVICES AND METHOD OF USING SAME

Alex R. Hobson, Elkton, Md.; F. Michael J. McCollam, Fife, United Kingdom, and Beth P. Powell, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 6, 1996, Appl. No. 659,600

Int. Cl.[7] G03G *21/00;15/20*

U.S. Cl. 399—352 **17 Claims**



1. A cleaning assembly for mounting in a printer device employing at least one critical image surface, comprising:

an assembly consisting essentially of an expanded polytetrafluoroethylene (PTFE) membrane exhibiting a node and fibril structure and in the absence of a release agent and a means for contacting at least a portion of the expanded PTFE membrane with the critical image surface; and

means for moving at least one of the assembly and the critical image surface relative to each other, whereby during said moving contaminates on the critical image surface are transferred to the assembly and held by the expanded PTFE membrane.

6,041,212

TONER REPLENISHING DEVICE OF IMAGE FORMING MACHINE AND TONER CARTRIDGE FOR USE THEREIN

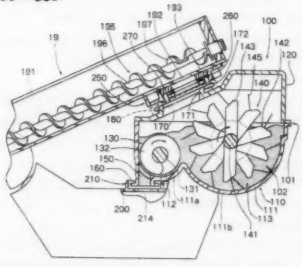
Mitsuharu Okada, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1998, Appl. No. 178,535

Claims priority, application Japan, Nov. 6, 1997, 9-304330

Int. Cl.[7] G03G *21/00*

U.S. Cl. 399—359 **8 Claims**



1. A toner replenishing device of an image forming machine comprising a photoconductor drum rotatably disposed in a machine housing, a developing device for applying toner to an electrostatic latent image formed on a circumferential surface of the photoconductor drum to develop it to a toner image, a cleaning device for removing remaining toner adhering to the circumferential surface of the photoconductor drum, recycle toner carrier means for carrying remaining toner removed by the cleaning device, and a toner cartridge accommodating toner to be fed to the developing device,

said toner cartridge being adapted to be detachably mounted in the machine housing; wherein

the toner cartridge comprises a container body having a toner transport passage, and toner transporter means disposed in the toner transport passage for transporting toner from one end portion toward the other end portion of the toner transport passage while agitating the toner along the toner transport passage, and the container body has a toner discharge port provided at the other end portion of the toner transport passage, and a recycle toner entry port provided at the one end portion of the toner transport passage; and

when the toner cartridge is mounted at a predetermined position, the toner discharge port is positioned opposite a toner feed port provided in the developing device, while the recycle toner entry port is positioned opposite a recycle toner drop port provided in the recycle toner carrier means, and wherein

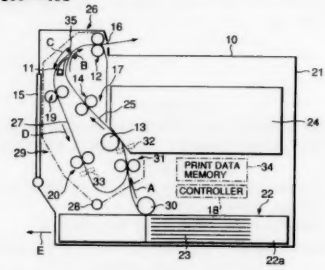
a toner agitation passage parallel to the toner transport passage is formed in the container body of the toner cartridge, and toner agitator means for moving toner toward the toner transport passage while agitating it is disposed in the toner agitation passage.

6,041,213

COMPACT IMAGE FORMING APPARATUS CAPABLE OF SMOOTH DOUBLE SIDE PRINTING IN A SHORT TIME

Kenzo Yanagi, Niigata, Japan, assignor to NEC Corporation, Japan

Filed Nov. 30, 1998, Appl. No. 203,197
Claims priority, application Japan, Nov. 28, 1997, 9-328538
Int. Cl.[7] G03G *15/00*
U.S. Cl. 399—401 **4 Claims**



1. An image forming apparatus comprising:

storage means for storing inputted printing data;

printing means for printing a recording paper based on the printing data stored in said storing means;

first waiting means;

first feeding means for feeding said recording paper after printing to said first waiting means, said first waiting means causing said recording paper to wait at said waiting means for a first waiting period;

paper reversing means for reversing the recording paper waiting at said first waiting means;

second waiting means;

second feeding means for feeding the reversed recording paper from said paper reversing means to said second waiting means, said second waiting means causing the recording paper sent from said paper reversing means to wait at said second waiting means for a second waiting period and then feeding the reversed recording paper to said printing means; and

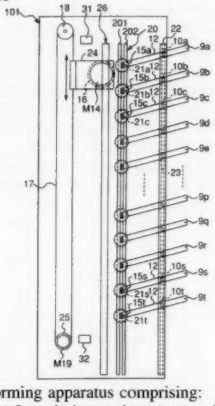
control means which reads and expands printing data for two pages succeeding the page printed on said preceding recording paper into a printable state after said recording paper has left said printing means for said first waiting means.

6,041,214

IMAGE FORMING APPARATUS CAPABLE OF IMPROVING EASE OF USE IN MAIL BIN MODE

Teruhiko Fujikura; Naoyoshi Kinoshita, both of Aichi-Ken; Makoto Fujii, Itami; Kenji Matsuhara, and Munehiro Natsume, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jan. 19, 1999, Appl. No. 232,996
Claims priority, application Japan, Jan. 19, 1998, 10-007680
Int. Cl.[7] G03G *15/00*
U.S. Cl. 399—403 **19 Claims**



1. An image forming apparatus comprising:

a printer section for printing an image on a sheet;

a sorter having a plurality of bins onto which a sheet printed with the image by the printer section is discharged;

a receiving section for receiving a print job transmitted externally, the print job including information indicating the number of pages of the image to be printed and the bin onto which the sheet printed with the image is to be discharged; and

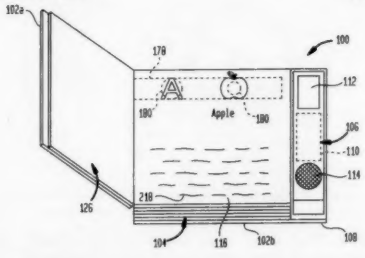
a controller for increasing a sheet accommodating capacity of said bin onto which the sheet is to be discharged when the number of pages of the print job received by said receiving section is greater than a specified number.

6,041,215

METHOD FOR MAKING AN ELECTRONIC BOOK FOR PRODUCING AUDIBLE SOUNDS IN RESPONSE TO VISUAL INDICIA

Richard Maddrell, Barrington, Ill., and Thomas L. Maser, Mequon, Wis., assignors to Publications International, Ltd., Lincolnwood, Ill.

Division of application No. 08/723,681, Sep. 30, 1996, Pat. No. 5,803,748. This application Mar. 31, 1998, Appl. No. 52,832.
Int. Cl.[7] G09B *5/00*
U.S. Cl. 434—317 **44 Claims**



1. A method for making an electronic book comprising the steps of: forming a plurality of leaves providing pages of said book; providing an internal passageway within at least one of said leaves having an opening thereinto; forming a switch circuit on a common

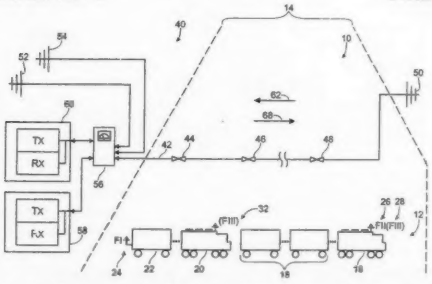
substrate having a first segment including at least one switch and a second segment including at least one conductive path in electrical connection with said at least one switch, said at least one switch including first and second spaced apart elements; arranging said first and second elements to overlie one another; inserting said first segment having said at least one switch into said passageway through said opening with said second segment having said at least one conductive path being external of said passageway so that said first and second elements create an electrical connection therebetween in response to pressure applied to said at least one leaf overlying one of said first and second elements.

6,041,216

RADIO COMMUNICATION SYSTEM FOR USE IN TUNNELS

Mark D. Rose, Corvallis, Oreg., and Robert W. Haining, Farnham, United Kingdom, assignors to Tunnel Radio of America, Inc., Corvallis, Oreg.

Filed Jan. 7, 1998, Appl. No. 4,057
Int. Cl.[7] **H04B** *1/60;15/00*
U.S. Cl. 455—9 **5 Claims**



1. A radio communications system for use by trains in a tunnel, comprising:

an antenna subsystem for receiving and sending RF signals, including:

a surface antenna located beyond the tunnel portals thereof at either end thereof;

a radiating coaxial cable located in and along the length of the tunnel;

plural bi-directional, in-line amplifiers disposed along the length of said Radiating coaxial cable at predetermined intervals for amplifying RF signals therein;

a monitoring repeater and a control repeater, and an interface for joining said monitoring repeater and said control repeater to said Radiating coaxial cable, wherein said interface corrects RF levels as said RF signals are received by said Radiating coaxial cable;

a monitoring subsystem, including:

an EOT device for sending a first status signal at a first predetermined interval and for receiving a second status signal;

a HOT device for sending said second status signal at a second predetermined interval and for receiving said first status signal, wherein said antenna subsystem receives and transmits said first and second status signals when the train is at least partially in the tunnel; and

a control subsystem, including:

a control encoder located in a control train engine for encoding control input signals for said engine;

a control transmitter for transmitting a control signal generated from the encoded control input signal;

a control receiver located in a controlled train engine for receiving said control signal; and

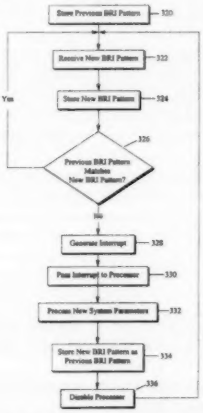
a control decoder for decoding said control signal into a control input signal for controlling said controlled engine.

6,041,217

PERSONAL HANDYPHONE SYSTEM HARDWARE CHECKING OF BROADCASTING RECEPTION INDICATION

Varenka Martin; Denis Archambaud, both of Antibes; Patrick Feyfant, Toulon; Philippe Gaglione, Mandelieu; Satoshi Yoshida, Nice; Laurent Winckel, and Oliver Weigelt, both of Antibes, all of France, assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 29, 1997, Appl. No. 902,091
Int. Cl.[7] **H04B** *7/00*
U.S. Cl. 455—38.3 **18 Claims**



1. A circuit arrangement for checking paging information transmitted in a personal handyphone system to a portable station, and for selectively activating a processor to analyze new system parameters transmitted in a broadcast control channel, the paging information including a broadcasting reception indication pattern, the circuit arrangement comprising:

a first memory portion for holding a previous broadcasting reception indication pattern;

an interrupt generator coupled to the first memory portion and the processor, the interrupt generator adapted to compare the previous broadcasting reception indication pattern with a current broadcasting reception indication pattern and to generate an interrupt when the current broadcasting reception indication pattern differs from the previous broadcasting reception indication pattern, the processor, in response to the interrupt, processing new system parameters corresponding to the current broadcasting reception indication pattern.

6,041,218

DEVICE AND METHOD FOR FACILITATING SELECTION OF A SELECTIVE CALLING RECEIVER RADIO AREA

Kazuhiro Kudoh, Shizuoka, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 5, 1997, Appl. No. 869,907
Claims priority, application Japan, Jun. 12, 1996, 8-150835
Int. Cl.[7] **H04B** *7/00*
U.S. Cl. 455—38.4 **3 Claims**

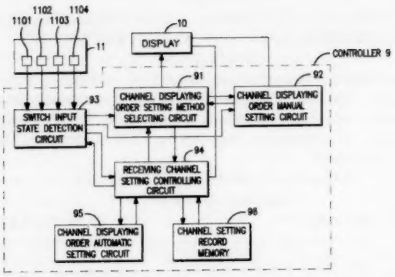
1. A selective calling receiver comprising:

a tuning circuit for tuning a receiving frequency;

a display for describing radio areas, each of which is associated with a particular receiving frequency;

a scrolling circuit for scrolling the described radio areas on the display and for changing a scrolling order of the described radio areas; and

a setting circuit, operated by a user of the receiver, for selecting one of the radio areas and its respective receiving frequency



based on said display, and for setting the selected radio area and receiving frequency at said tuning circuit,

wherein said scrolling circuit comprises a deciding circuit for changing said scrolling order so that the selected radio area and associated receiving frequency has a priority in the scrolling order, and

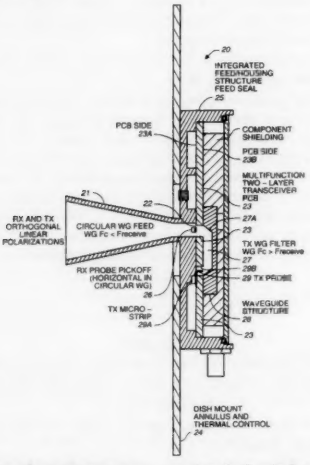
wherein said deciding circuit comprises an automatic deciding circuit for deciding said scrolling order based on a past setting of a receiving frequency.

6,041,219

INTEGRATED ORTHOGONAL MODE TRANSDUCER/ FILTER DESIGN FOR MICROWAVE FREQUENCY-DOMAIN

Dean F. Peterson, Groton, Mass., assignor to Wytec, Incorporated, Santa Clara, Calif.

Filed Oct. 1, 1998, Appl. No. 164,574
Int. Cl.[7] H04B *1/40*
U.S. Cl. 455—81 **9 Claims**



1. A transceiver apparatus on a printed circuit board (PCB) comprising:

a first probe for being excited with received signals in a first frequency range and coupling said received signals to receive circuitry, said first probe oriented in a first position;

a second probe coupled to transmit circuitry for generating, through excitation, transmit signals in a second frequency range, said second probe oriented orthogonal to said first probe such that said transmit signals are polarized essentially orthogonally with respect to said receive signals;

an enclosed waveguide structure positioned between said first and second probes, said enclosed waveguide structure having first and second ends, a top closed portion, and a bottom open portion, said bottom open portion being fixedly attached to said PCB so as to form an enclosed waveguide area;

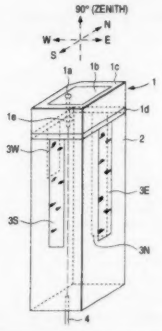
wherein said first end of said enclosed waveguide structure is positioned over an opening in said PCB and one of said first and second probes is positioned at said opening, said other one of said first and second probes is positioned at said second end of said enclosed waveguide structure, and said enclosed waveguide structure provides frequency isolation between said transmit and received signals.

6,041,220

PORTABLE RADIO COMMUNICATION APPARATUS

Akihiro Suguro, Yokohama, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Jul. 24, 1997, Appl. No. 924,202
Claims priority, application Japan, Jul. 25, 1996, 8-196035
Int. Cl.[7] H04B *1/38*
U.S. Cl. 455—90 **5 Claims**



1. A portable radio communication apparatus comprising:

a case body; and

an antenna device having a surface on which radiation of an output of said antenna device is suppressed in at least one direction, the antenna device including a plurality of directionally related linear radiating elements, at least one of which is altered relative to the others to achieve the suppression in at least one direction;

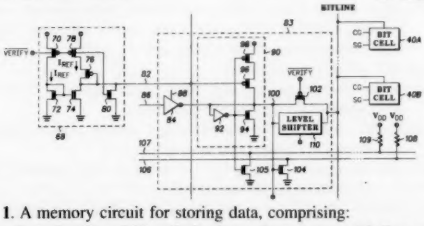
wherein said antenna device is attached to said case body so that the radiation-output-suppressed surface of said antenna device is arranged to face an user side at the time of talking.

6,041,221

CIRCUIT AND METHOD FOR VERIFYING DATA OF A WIRELESS COMMUNICATIONS DEVICE

James S. Caravella, Chandler; David F. Mietus, Phoenix, and Jeremy W. Moore, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1997, Appl. No. 859,898
Int. Cl.[7] H04Q *7/20*
U.S. Cl. 455—186.1 **19 Claims**



1. A memory circuit for storing data, comprising:

a first plurality of bit cells having a first common bit line; and

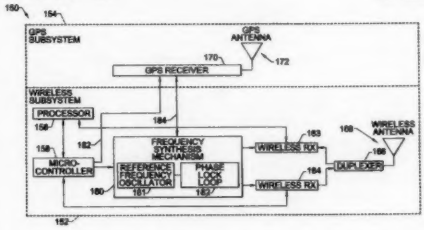
a first latch having an output for providing a reference current which is compensated for supply voltage variation to the first common bit line when the first latch is set to a first state to verify a programming state of one of the first plurality of bit cells, wherein the first latch switches to a second state and discontinues providing the reference current when the one of the first plurality of bit cells sinks the reference current.

6,041,222

SYSTEMS AND METHODS FOR SHARING REFERENCE FREQUENCY SIGNALS WITHIN A WIRELESS MOBILE TERMINAL BETWEEN A WIRELESS TRANSCEIVER AND A GLOBAL POSITIONING SYSTEM RECEIVER

Robert Ray Horton, Apex, and William O. Camp, Jr., Chapel Hill, both of N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Sep. 8, 1997, Appl. No. 925,566
Int. Cl.[7] H04B *1/40*
U.S. Cl. 455—255 **20 Claims**



1. A wireless mobile terminal for a wireless communications system, comprising:

a wireless transceiver; and

a global positioning system (GPS) receiver that shares a reference oscillator signal with said wireless transceiver, comprising:

a multiplier that multiplies the reference oscillator signal by a first integer to produce a first GPS local oscillator signal;

a first mixer that is responsive to the first GPS local oscillator signal and a GPS satellite signal and generates a first output signal having an intermediate frequency;

a first divider that divides the reference oscillator signal by a second integer to produce a second GPS local oscillator signal;

a second mixer that is responsive to the first output signal and the second GPS local oscillator signal and generates a second output signal used by the GPS receiver for signal processing; and

a second divider that divides the reference oscillator signal by a third integer to produce a third GPS local oscillator signal used in signal processing by the GPS receiver.

6,041,223

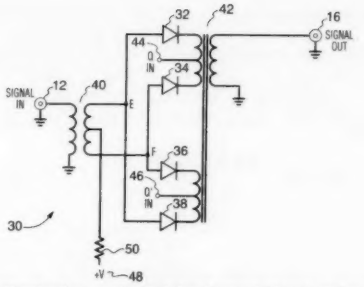
HIGH LEVEL DIODE MIXER

Robert McLaren Thomas, Nepean, Canada, assignor to Nortel Networks Corporation, Montreal, Canada

Filed Mar. 26, 1998, Appl. No. 48,072
Int. Cl.[7] H04B *1/26*
U.S. Cl. 455—326 **17 Claims**

1. A double balanced mixer circuit for mixing a first input signal with a second input signal oscillating between a positive voltage and a zero voltage at a higher frequency than said first signal, and providing an output signal comprising said first input signal modulated at the frequency of said second input signal, said double balanced mixer circuit comprising:

a first solid state switching means for receiving said first input signal and said second input signal and transmitting said output signal, responsive to said second input signal having an amplitude of zero volts by being forward-biased, and coupling said first input signal to said output signal;



a second solid state switching means for receiving said first input signal and said second input signal and transmitting said output signal, responsive to a complement of said second input signal having an amplitude of zero volts by being forward-biased, and coupling an inversion of said first input signal to said output signal; and

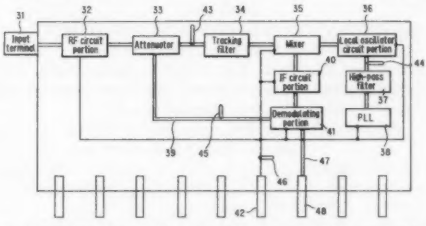
means for electrically interconnecting said first solid state switching means with said second solid state switching means so that either one of said first or said second solid state switching means being in a forward-bias state provides a low voltage potential to the other of said solid state switching means against which said other of said solid state switching means becomes reversed-bias with respect to said positive voltage.

6,041,224

DBS TUNER FOR SATELLITE BROADCASTING RECEIVERS

Yasuhiro Wada, Takatsuki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1997, Appl. No. 824,123
Claims priority, application Japan, Apr. 26, 1996, 8-107243
Int. Cl.[7] H04B *1/26;1/10*
U.S. Cl. 455—327 **19 Claims**



1. A receiver for a direct broadcasting satellite transmission comprising:

an attenuating filter including a microstrip transmission line having an open-ended load terminations directly projecting from the transmission line the load terminations having different lengths including a shorter length tuned to a third harmonic of a locally generated signal and a longer length tuned to a second harmonic of the locally generated signal;

a tuner assembly for receiving an input signal at an input terminal, the tuner assembly providing a radio frequency path for the input signal, wherein the attenuating filter is coupled into said radio frequency path;

a phase-locking circuit; and

a local oscillator coupled to the phase-locking circuit, the attenuating filter being provided in the radio frequency transmission path for the locally generated signal from the local oscillator to the phase-locking circuit to attenuate leakage of the second and the third harmonic of the locally generated signal associated with the input terminal.

6,041,225

MONITOR CONTROL CIRCUIT USING WIRELESS HEADPHONES AND METHOD THEREFOR

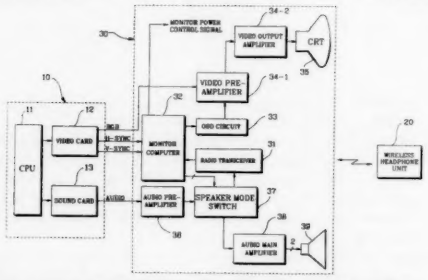
Sung-Gon Jung, Kyunki-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 28, 1997, Appl. No. 959,067

Claims priority, application Rep. of Korea, Oct. 28, 1996, 96-49290

Int. Cl.[7] H04B *1/06*

U.S. Cl. 455—352 **13 Claims**



1. A circuit for controlling a computer monitor receiving a speaker input signal, said circuit comprising:

wireless headphones for outputting a first control signal based on a user input command;

a radio transceiver for generating a second control signal based on the first control signal from said wireless headphones;

a first microcomputer for generating a switching control signal according to the second control signal from said radio transceiver; and

switching means for receiving the speaker input signal and selectively outputting the received speaker input signal to said radio transceiver as a controlled audio signal for transmission to said wireless headphones or to an audio amplifier in said monitor for driving a speaker, according to the switching control signal from said first microcomputer.

6,041,226

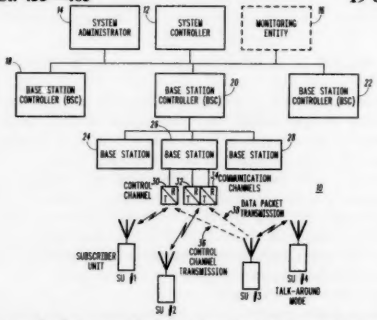
METHOD AND APPARATUS FOR MONITORING SUBSCRIBER TALK-AROUND USAGE

John P. Skoro, III, Plano, Tex.; Brian K. Bunkenburg, Glen Ellyn, and Mark L. Shaughnessy, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 9, 1997, Appl. No. 947,590

Int. Cl.[7] H04Q *7/20*

U.S. Cl. 455—405 **19 Claims**



1. A method for monitoring subscriber talk-around usage, the method comprising the steps of:

detecting selection of talk-around mode for a subscriber unit;

providing an indication of the selection of the talk-around mode to a monitoring entity; and

determining, by the monitoring entity, usage of the talk-around mode by the subscriber unit by monitoring at least one of: elapsed time of the usage of the talk-around mode, quantity of transmissions initiated while in the talk-around mode, and time of day of the usage of the talk-around mode.

6,041,227

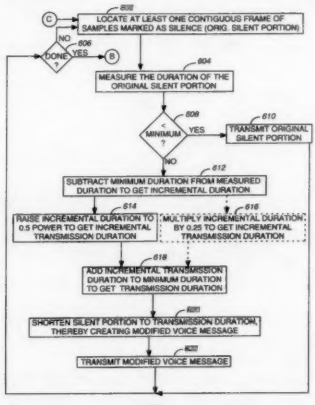
METHOD AND APPARATUS FOR REDUCING TRANSMISSION TIME REQUIRED TO COMMUNICATE A SILENT PORTION OF A VOICE MESSAGE

Terence Edward Sumner, Azle, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1997, Appl. No. 921,638

Int. Cl.[7] H04Q *7/20*

U.S. Cl. 455—412 **18 Claims**


LOCATE AT LEAST ONE CONTIGUOUS FRAME OF SAMPLES MARKED AS SILENCE (ORIG. SILENT PORTION)
DONE?
NO
YES
MEASURE THE DURATION OF THE ORIGINAL SILENT PORTION
< MINIMUM ?
YES
NO
TRANSMIT ORIGINAL SILENT PORTION
SUBTRACT MINIMUM DURATION FROM MEASURED DURATION TO GET INCREMENTAL DURATION
RAISE INCREMENTAL DURATION TO 0.5 POWER TO GET INCREMENTAL TRANSMISSION DURATION
MULTIPLY INCREMENTAL DURATION BY 0.25 TO GET INCREMENTAL TRANSMISSION DURATION
ADD INCREMENTAL TRANSMISSION DURATION TO MINIMUM DURATION TO GET TRANSMISSION DURATION
SHORTEN SILENT PORTION TO TRANSMISSION DURATION, THEREBY CREATING MODIFIED VOICE MESSAGE
TRANSMIT MODIFIED VOICE MESSAGE

1. A method for reducing a transmission time required for communicating an original silent portion of an original voice message in a wireless voice messaging system, the original silent portion having an original duration, the method comprising the steps of:

processing the original voice message to detect the original silent portion and to measure the original duration;

creating a modified voice message, when the original duration is not less than a predetermined minimum duration that can be reliably detected by a subscriber unit, by replacing the original silent portion with a modified silent portion having a transmission duration equal to a sum of an incremental transmission duration and the predetermined minimum duration, wherein the incremental transmission duration is mathematically derived from an incremental duration and is shorter than the incremental duration, and wherein the incremental duration is equal to the original duration less the predetermined minimum duration; and

transmitting the modified voice message by the wireless voice messaging system to improve transmission efficiency by utilizing a greater compression ratio for speech pauses than is possible for voiced and unvoiced speech.

6,041,228

OPEN 'PLUG AND PLAY' O AND M ARCHITECTURE FOR A RADIO BASE STATION

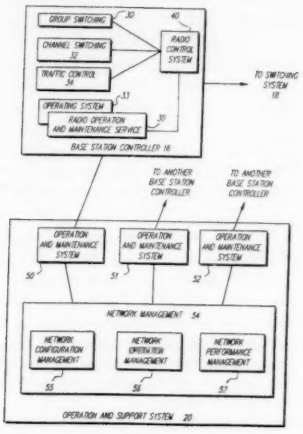
Håkan Niska; Bo Kvarnström, both of Linköping, and Jan Oom, Rimforsa, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 27, 1997, Appl. No. 958,337

Int. Cl.[7] H04B *7/00*

U.S. Cl. 455—419 **25 Claims**

7. A base station, comprising:



a base station resource infrastructure management layer for administration of the base station software and hardware infrastructure;

a base station abstract resource management layer having its own element management operating system based on an abstract information model identifying operational capabilities of the base station software and hardware infrastructure, wherein said information model is independent of any format of said base station software and hardware infrastructure; and

a site capabilities application for creating the abstract information model based on the base station software and hardware infrastructure.

6,041,229

TRANSFERRING INFORMATION

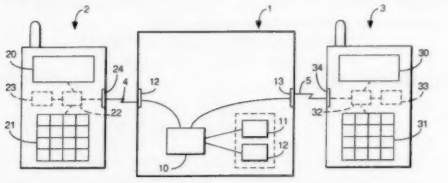
Clive Nathan Turner, Turku, Finland, assignor to Nokia Mobile Phones, Ltd., Salo, Finland

Filed Feb. 6, 1997, Appl. No. 796,139

Claims priority, application United Kingdom, Feb. 9, 1996, 9602662

Int. Cl.[7] **H04Q** *7/90*

U.S. Cl. 455—420 **14 Claims**



1. Apparatus for transferring information from a first radio telephone to a second radio telephone, comprising:

first communication means for communicating with the first radio telephone;

second communication means for communicating with the second radio telephone; and

data transfer means for communicating between the first and second communication means and operable under the control of the second radio telephone for reading information from the first radio telephone and transmitting that information to the second radio telephone, wherein the data transfer means includes telephone comparison means for reading type information from the first and second radio telephones and inhibiting transfer of information between the radio telephones if the type information is incompatible.

6,041,230

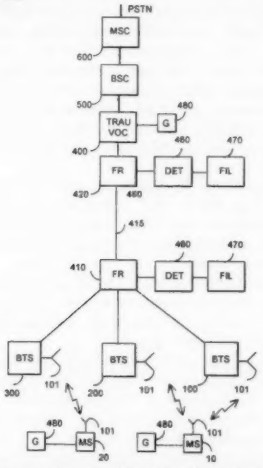
TRANSMISSION METHOD AND A CELLULAR RADIO SYSTEM

Mikko Siira, Oulu, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

Filed Mar. 13, 1997, Appl. No. 816,520

Int. Cl.[7] **H04Q** *7/20;* **H04B** *1/38;* **H04M** *1/00;* **H04S** *3/17*

U.S. Cl. 455—422 **17 Claims**



1. A transmission method used in a cellular radio system during discontinuous transmission when there are pauses in the transmission, which are detected, the cellular radio system comprising at least one base station and vocoder which communicate with each other via a transmission path and which transmit a signal to each other, the method comprising:

receiving a signal;

encoding the received signal which at least partly consists of spare bits; and

filtering off spare bits from the signal to be transmitted to the transmission path prior to transmitting the signal, wherein a signal is transmitted that comprises only non-spare bits.

6,041,231

MOBILE COMMUNICATION SYSTEM WITH ROAMING FUNCTION

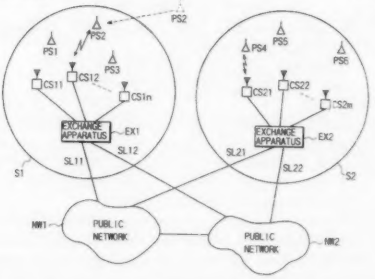
Hirokazu Suzuki, Yamato, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 2, 1997, Appl. No. 887,409

Claims priority, application Japan, Jul. 3, 1996, 8-173811

Int. Cl.[7] **H04Q** *7/20*

U.S. Cl. 455—422 **32 Claims**



1. A mobile communication system which comprises a plurality of base stations distributed in a service area, a terminal device connected to one of said base stations via a radio channel, and a

radio control apparatus which accommodates said plurality of base stations and systematically controls said system,

wherein said radio control apparatus comprises:

monitoring means for monitoring whether or not a temporary use registration request that requests temporary use registration for said system is received from said terminal device;

setting means for, when said monitoring means detects that the temporary use registration request is received, setting first terminal identification information to be used by a request source terminal device in said system, said request source terminal device originally belonging to said at least one different mobile communications system;

request response means for supplying use permission information including the first terminal identification information set by said setting means to the request source terminal device;

first storage means for storing the first terminal identification information set by said setting means in correspondence with second terminal identification information used in the another system to which the request source terminal device originally belongs;

first control means for executing subsequent call origination/termination control associated with the request source terminal device on the basis of the information stored in said first storage means; and

means for continuously broadcasting, from the base station, message information indicating if a permission of the temporary use registration is to be supplied to the terminal device which is not registered in said system, and

wherein said terminal device comprises:

request transmission means for transmitting the temporary use registration request to said radio control apparatus, said request transmission means receiving the message information and checking based on the message information if the temporary use registration request is permitted, and transmitting the temporary use registration request to said radio control apparatus only when it is determined that the temporary use registration request is permitted;

second storage means for, when the use permission information is supplied from said radio control apparatus in response to the transmitted temporary use registration request, storing the first terminal identification information included in the use permission information together with a system identification number of said system; and

second control means for executing subsequent call origination/termination control of an own terminal device in said system on the basis of the information stored in said second storage means, said own terminal device originally belonging to said system.

6,041,232

AGGREGATION OF SHAPED DIRECTIONAL RECEIVING ANTENNA ARRAY FOR IMPROVED LOCATION INFORMATION

Earle Willis Jennings, III, San Jose, Calif., assignor to SC-Wireless Inc., San Jose, Calif.

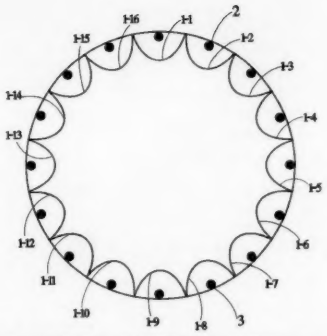
Filed Dec. 23, 1997, Appl. No. 997,155

Int. Cl.[7] **H04Q** *7/00;21/00;* **H04B** *1/40*

U.S. Cl. 455—422 **21 Claims**

21. A communications device for use with users transmitting in a communication medium with user transmissions characterized by time-propagation displacement and location displacement as a function of a user location relative to a communications device location, the communications device comprising,

an antenna collection including two or more directional antennae where each antenna is defined by a base location vector, an attenuation function having a contour map and an antenna orientation direction vector lying in the contour map and where each antenna connects to an antenna interface circuit having time steps which generates quantities over time intervals based upon received user transmissions and wherein the



contour map for one of the directional antennae overlaps the contour map of another one of the directional antennae whereby the received user transmission at said two or more antennae are linearly related,

said antenna collection having said two or more directional antennae with base location vectors proximate to a common boundary of a shape in two or more dimensions,

said antenna collection having a collection center wherein the base location vector for each of said antenna is a distance from said collection center which is small compared with the distance traveled by user transmissions propagating in the communications medium within the time step of the antenna interface sampling circuitry and wherein the antenna orientation direction vector for each of said antenna has a location measure in one or more dimensions relative to the antenna collection center,

one or more information processors receiving the antenna generated quantities for each time step of the interface circuit for each of the antennae to provide discrete time-propagation displacements and discrete location displacements, and said information processors transforming a linear combination of said discrete time-propagation displacements and said discrete location displacements to form transformed combinations providing user location information.

6,041,233

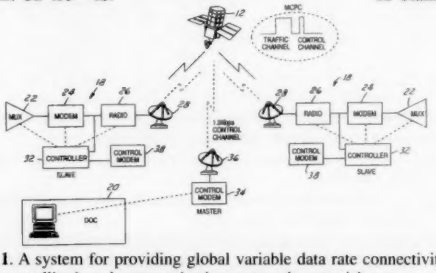
METHOD AND SYSTEM FOR PROVIDING GLOBAL VARIABLE DATA RATE CONNECTIVITY IN A SATELLITE-BASED COMMUNICATIONS NETWORK

Ronald F. Rosati, El Segundo, Calif., assignor to Hughes Electronics Corporation, El Segundo, Calif.

Filed Sep. 12, 1997, Appl. No. 928,886

Int. Cl.[7] **H04B** *7/185;7/204*

U.S. Cl. 455—427 **12 Claims**



1. A system for providing global variable data rate connectivity in a satellite-based communications network comprising:

communications satellites for transmitting and receiving signals in a plurality of coverage areas; and

user terminals for transmitting and receiving signals to and from the satellites;

wherein a first set of the user terminals located in one of the plurality of coverage areas and associated with one of the

communications satellites has a variable bandwidth associated therewith based on the collective bandwidth requirements of each of the first set of user terminals;

wherein each of the first set of user terminals has a variable terminal bandwidth associated therewith which varies in response to a bandwidth request from each of the first set of user terminals;

the system further comprising a ground facility for controlling the variable bandwidth and the variable terminal bandwidth of the first set of user terminals in response to the bandwidth request;

wherein the first set of user terminals includes a plurality of pairs of user terminals and wherein each of the user terminals include a controller for receiving controlling signals and for transmitting monitoring signals, wherein the controller of a first one of each of the pairs receives the signals from the ground facility and the controller of a second one of each of the pairs receives the signals from the first one.

6,041,234

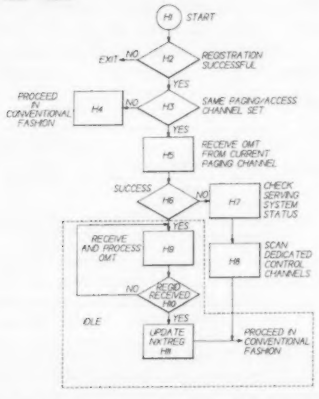
METHOD AND APPARATUS FOR REGISTERING A RADIO TELEPHONE SUBSCRIBER UNIT WHEREIN THE SUBSCRIBER UNIT REMAINS TUNED TO THE REGISTERING CHANNEL AFTER SUCCESSFUL REGISTRATION

Markku Tapio Oksanen, Salo, Finland; Juha Peranto, Irving, Tex., and Martti Ensio Vuorio, Halikko, Finland, assignors to Nokia Mobile Phones Limited, Salo, Finland

Filed Apr. 25, 1996, Appl. No. 637,407

Int. Cl.[7] H04Q *7/22*

U.S. Cl. 455—434 **20 Claims**



1. A method for operating a radio telephone subscriber unit to register with a cellular system, comprising the steps of:

determining from registration-related information that is received from the cellular system that the subscriber unit must register with the cellular system;

transmitting the registration message to the cellular system on a selected channel;

determining that the registration message was accepted by the cellular system as a successful registration; and

during initialization operations invoked after the successful registration, and for a case where the channel on which the registration message is sent is also in a paging channel set, remaining tuned to the selected channel, without rescanning for a dedicated control channel or for a paging channel, until a receipt of next registration-related information from the cellular system.

6,041,235

HANDOVER METHOD AND ARRANGEMENT FOR A MOBILE COMMUNICATION SYSTEM

Risto Aalto, Riihimäki, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

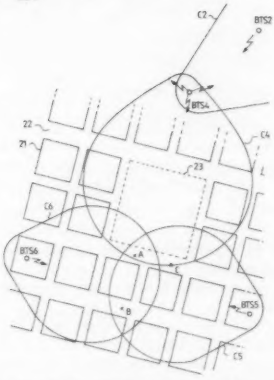
PCT No. PCT/FI95/00210, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996, PCT Pub. No. WO95/28808, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 12, 1995, Appl. No. 727,656

Claims priority, application Finland, Apr. 15, 1994, 941779

Int. Cl.[7] H04Q *7/22*

U.S. Cl. 455—437 **13 Claims**



1. A handover method, said handover method comprising:

measuring at a mobile station at least a reception level of a signal of a serving cell;

measuring at a mobile station a reception level of signals from a limited number of cells adjacent to said serving cell;

detecting a need for handover;

selecting with the aid of measurements at least one adjacent cell as a candidate cell for handover;

assigning, from said adjacent cells to be measured, to at least one candidate cell, one or more reference cells possessing a signal profile similar to that of a more remote cell which is a potential source of co-channel or adjacent channel interference in the respective candidate cell, but which is not directly measurable by said mobile station in said serving cell;

estimating an interference level caused by at least one other cell in said at least one candidate cell, if said at least one other cell is a potential source of interference in said candidate cell; and

utilizing said estimated interference level as an additional criterion for selection of a target cell for handover so that a possibility of handover to a cell with a high interference level is diminished.

6,041,236

METHOD AND APPARATUS FOR MINIMIZING THE NUMBER OF SAMPLES NEEDED TO DETERMINE CELL AREA COVERAGE RELIABILITY IN A RADIOTELEPHONE SYSTEM

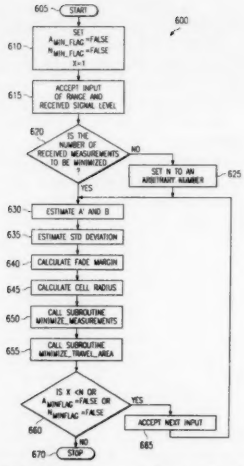
Charles P. Bernardin, and Meng F. Yee, both of Richardson, Tex., assignors to Nortel Networks Corporation, Richardson, Tex.

Provisional application No. 60/023,948, Aug. 9, 1996. This application Dec. 18, 1996, Appl. No. 769,690.

Int. Cl.[7] H04Q *7/22*

U.S. Cl. 455—446 **18 Claims**

1. A method of determining, with a predetermined maximum RF coverage area inaccuracy ΔF_a and with a minimum number of signal power value measurements, the radius R of a cell of a wireless communication system, said wireless communication including a base station transmitter, said method comprising the steps of:


600
605 START
610 SET A_MIN_FLAG =FALSE, B_MIN_FLAG =FALSE, X=1
615 ACCEPT INPUT OF RANGE AND RECEIVED SIGNAL LEVEL
620 IS THE NUMBER OF RECEIVED MEASUREMENTS TO BE MINIMIZED
NO
625 SET N TO AN ARBITRARY NUMBER
YES
630 ESTIMATE A' AND B
635 ESTIMATE STD DEVIATION
640 CALCULATE FADE MARGIN
645 CALCULATE CELL RADIUS
650 CALL SUBROUTINE MINIMIZE_MEASUREMENTS
655 CALL SUBROUTINE MINIMIZE_TRAVEL_AREA
660 IS X <N OR A_MINFLAG =FALSE OR B_MINFLAG =FALSE
YES
685 ACCEPT NEXT INPUT
NO
670 STOP

a) measuring RF signal power value at a location a distance r from said transmitter;

b) estimating said radius R based upon said measured signal power values;

c) computing an RF coverage area inaccuracy ΔF_u based upon said measured signal power values; and,

d) repeating steps a) through c) at different locations until ΔF_u is equal to or less than said predetermined maximum RF coverage area inaccuracy.

6,041,237

METHOD OF CHANNEL ALLOCATION

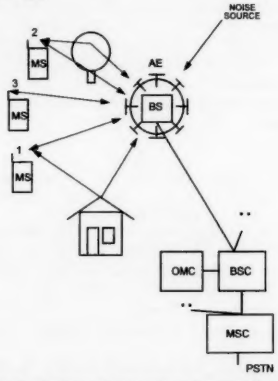
Christof Farsakh, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1998, Appl. No. 53,963

Claims priority, application Germany, Apr. 2, 1997, 197 13 666

Int. Cl.[7] **H04B** *7/212;* **H04Q** *7/20*

U.S. Cl. 455—450 **7 Claims**



1. A method of channel allocation for a K^{th} communication connection via a radio interface in a mobile communication system with spatial subscriber separation comprising the steps of:

providing at least $K_{ges}-1$ communication connections in L channels for management via the radio interface;

allowing K–1 communication connections in each channel, wherein l=1 . . . L;

determining spatial covariance matrices $C_1^{(l)}, \ldots, C_{K-1}^{(l)}$ for the existing K– 1 communication connections;

determining noise values $N_1^{(l)}, \ldots, N_{K-1}^{(l)}$ for the existing K–1 communication connections;

determining an anticipated noise value for the K^{th} communication connection;

determining an anticipated spatial covariance matrix $C_k^{(l)}$ for the K^{th} communication connection;

determining an anticipated noise value $N_K^{(l)}$ for the K^{th} communication connection;

determining an anticipated downlink transmission power $P^{(l)}$ for the l^{th} channel with K communication connections in order to adhere to a required signal-to-noise ratio criterion;

determining a decision value $c^{(l)}$ from a relationship of the anticipated downlink transmission power $P^{(l)}$ for the channel l and a reference transmission power $(\tilde{P}^{(l)})$; and

allocating the channel l having the lowest decision value $c^{(l)}$ to the K^{th} communication connection.

6,041,238

CHANNEL ASSIGNMENT METHOD IN MOBILE COMMUNICATIONS SYSTEM

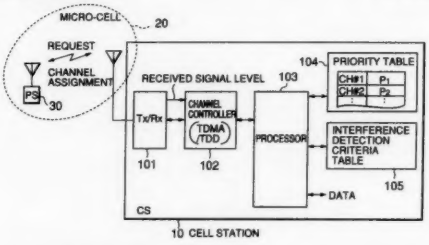
Katsumi Tanoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 29, 1998, Appl. No. 106,258

Claims priority, application Japan, Jun. 30, 1997, 9-174330

Int. Cl.[7] **H04J** *3/12;* **H04B** *1/00;* **H04L** *12/28*

U.S. Cl. 455—452 **14 Claims**



1. A method for dynamically assigning a communication channel to a mobile station in each base station of TDMA/TDD (Time Division Multiple Access/Time Division Duplex) communications system, comprising the steps of:

a) receiving a control signal from the mobile station;

b) determining an interference detection criterion depending on a signal strength of the control signal;

c) selecting a channel from a plurality of predetermined channels;

d) determining whether interference occurs in a selected transmitting time slot relative to the interference detection criterion in a selected channel;

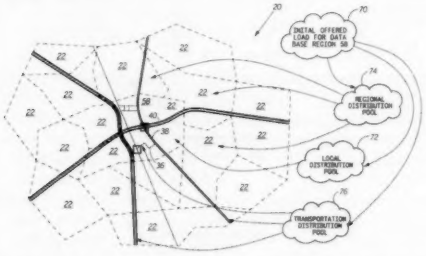
e) determining whether interference occurs in a selected receiving time slot relative to a predetermined interference detection criterion in the selected channel; and

f) assigning the selected channel as a communication channel to the mobile station when it is determined that no interference occurs in the selected transmitting and receiving time slots.

6,041,239
METHOD AND APPARATUS FOR DISTRIBUTING OFFERED LOAD IN A WIRELESS COMMUNICATIONS SYSTEM

John Douglas Reed, Arlington, and Jack Anthony Smith, Haltom City, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1997, Appl. No. 896,576
Int. Cl.[7] H04Q *7/20;7/22*
U.S. Cl. 455—453 **27 Claims**


INITIAL OFFERED LOAD FOR DATA BASE REGION 50
REGIONAL DISTRIBUTION POOL
LOCAL DISTRIBUTION POOL
TRANSPORTATION DISTRIBUTION POOL

1. A method in a wireless communications system service area model for calculating and locating an offered load, the method comprising the steps of:

selecting a population database that describes a population in database regions in the wireless communications system service area;

selecting a transportation database that describes transportation arteries in the wireless communications system service area;

calculating an initial offered load for each database region;

allocating a portion of each of the initial offered loads to a transportation distribution pool;

distributing the offered load of the transportation distribution pool over the transportation arteries; and

accounting for allocation of offered loads to the transportation distribution pool, and for distribution of offered load in the transportation distribution pool over transportation arteries in each database region, wherein a database region offered load is calculated for each database region.

6,041,240
CLEAR CHANNEL SELECTION SYSTEM FOR A CORDLESS TELEPHONE

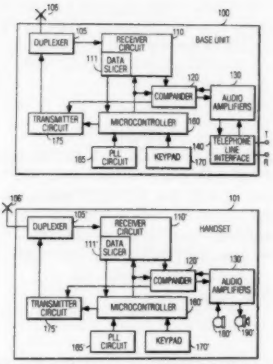
Dennis Ronald McCarthy, Syracuse; John Mark Fossaceca, Baldwinville, and Maneck Behram Kapadia, Liverpool, all of N.Y., assignors to Thomson Consumer Electronics Inc., Indianapolis, Ind.

Continuation of application No. 08/491,102, Jun. 16, 1995, abandoned, which is a continuation of application No. 08/353,583, Dec. 8, 1994, abandoned, which is a continuation of application No. 08/177,670, Jan. 5, 1994, abandoned. This application Mar. 10, 1997, Appl. No. 814,622.
Int. Cl.[7] H04Q *7/32*
U.S. Cl. 455—464 **9 Claims**

8. A cordless telephone set exhibiting an off-hook state for enabling communication via an external telephone network, and an on-hook state, said cordless telephone set comprising:

a base unit and a handunit operating on one of a plurality of cordless telephone channels, each of said cordless telephone channels providing for communication between said handunit and said base unit via a base unit transmission frequency and a handunit transmission frequency;

a monitoring circuit located in said base unit or said handunit for monitoring, during said on-hook state, the frequency content of a baseband signal derived from a respective one of said base unit transmission frequency or said handunit transmission frequency for producing an output signal indicative of said one cordless telephone channel being occupied or noisy;



said monitoring circuit having a threshold of detection of a first value in said on-hook state and of a second value, higher than said first value, in said off-hook state;

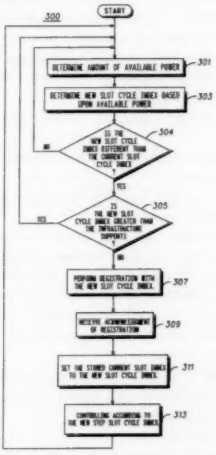
said monitoring circuit of said base unit and said monitoring circuit of said handunit operating in said off-hook mode for detecting baseband digital control signals;

said cordless telephone set, in response to said output signal, causing said base unit and said handunit to change to a second cordless telephone channel.

6,041,241
APPARATUS AND METHOD FOR BALANCING POWER SAVINGS AND CALL SET UP TIME IN A WIRELESS COMMUNICATION DEVICE

William Daniel Willey, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1997, Appl. No. 810,718
Int. Cl.[7] H04B *1/38*
U.S. Cl. 455—574 **4 Claims**


START
DETERMINE AMOUNT OF AVAILABLE POWER
DETERMINE NEW SLOT CYCLE INDEX BASED UPON AVAILABLE POWER
IS THE NEW SLOT CYCLE INDEX DIFFERENT THAN THE CURRENT SLOT CYCLE INDEX
IS THE NEW SLOT CYCLE INDEX GREATER THAN THE INFRASTRUCTURE SUPPORTS
PERFORM REGISTRATION WITH THE NEW SLOT CYCLE INDEX
RECEIVE ACKNOWLEDGEMENT OF REGISTRATION
SET THE STORED CURRENT SLOT INDEX TO THE NEW SLOT CYCLE INDEX
CONTROLLING ACCORDING TO THE NEW SLOT CYCLE INDEX

3. A method of balancing power savings and call setup time comprising the steps of:

a) determining an amount of power available to a wireless communication device;

b) determining a new slot cycle index according to the amount of power available to the wireless communication device;

c) determining if the new slot cycle index is greater than a maximum slot cycle index; and

d) if the new slot cycle index is not greater than the maximum slot cycle index, controlling the wireless communication device according to the new slot cycle index.

6,041,242

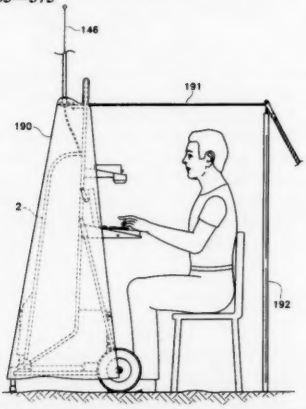
PORTABLE EMERGENCY RESPONSE COMMUNICATIONS SYSTEM AND METHOD

Steve M. Coulthard, P.O. Box 871830, Wasilla, Ak. 99687

Provisional application No. 60/020,039, Jun. 21, 1996, Provisional application No. 60/034,138, Dec. 30, 1996. This application Jun. 16, 1997, Appl. No. 876,257.

Int. Cl.[7] **H04Q** *7/20*

U.S. Cl. 455—575 **38 Claims**



1. A portable emergency response communications system comprising:

a. a power system comprising:

i. a battery condition indicator;

ii. a master power switch;

iii. at least one portable DC battery containing DC power;

iv. circuitry adapted to deliver said DC power;

v. an impact resistant case adapted to withstand a substantial impact load to protect said DC battery;

b. a frame adapted to support said power system comprising:

i. a power system support;

ii. a holding element adapted to hold said power system to said frame;

iii. a first upright member rotatably connected to said power system support;

iv. a second upright member rotatably connected to said power system support;

v. at least one frame securing element adapted to secure said first upright member with said second upright member in at least a raised first position and a lowered second position;

vi. at least one radio support shelf adapted to support at least one radio and mounted to said frame; and

vii. at least one antenna mount connected to said frame and adapted for a radio;

c. a light adapted to illuminate at least a portion of said frame;

d. at least one radio connection port comprising:

i. a latching multi-pronged port;

ii. a weather shield cover, and

iii. an orientation element;

e. a battery charger responsive to said frame;

f. a DC to AC inverter; and

g. a mobile element connected to said frame adapted to enable movement of said frame with said power system

wherein said power system, said frame, said light, said radio connection ports, said battery charger, said inverter, and said mobile element combine to form an impact resistant, portable emergency response communications system.

6,041,243

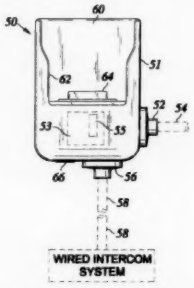
PERSONAL COMMUNICATIONS UNIT

Steven Frederic Davidson, Skoki; Kim David Vollendorf, Cary; Michael Frank DiCicco, Carol Stream; Stuart John Collar, Algonquin, and Jeffrey Jay Stone, North Barrington, all of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed May 15, 1998, Appl. No. 79,655

Int. Cl.[7] **H04B** *1/38*

U.S. Cl. 455—575 **19 Claims**



1. A personal communications unit for facilitating both wired and wireless communications with a wired intercom system, the personal communications unit comprising:

a) a headset cable for connection to a variety of headsets;

b) an intercom connection cable placeable in electrical communication with the headset and placeable in electrical communication with the wired intercom system;

c) a radio transceiver which is placeable into electrical communication with the headset;

d) a switching circuit configured to place the intercom connection cable in electrical communication with the headset when the intercom connection cable is in electrical communication with the wired intercom system, and to place the radio transceiver in electrical communication with the headset when the intercom connection cable is not in electrical communication with the headset; and

e) wherein wired communications with the wired intercom system are facilitated when the intercom connection cable is in electrical communication with the wired intercom system, and wireless communications with the wired intercom system are facilitated when the intercom connection cable is not in electrical communication with the wired intercom system.

6,041,244

RADIO COMMUNICATION APPARATUS HAVING A PLURALITY OF IDENTIFICATION CODES

Kazuyasu Yamane, Hamura; Takeya Oikawa, Ome, and Tomohiro Niimi, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

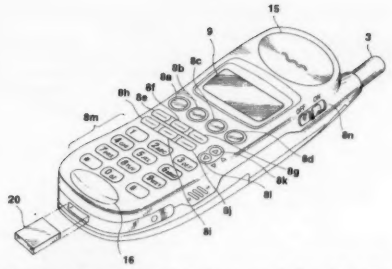
Division of application No. 08/827,399, Mar. 27, 1997, which is a continuation of application No. 08/458,788, Jun. 2, 1995, abandoned. This application Aug. 5, 1998, Appl. No. 129,718. Claims priority, application Japan, Jun. 30, 1994, 6-149055

Int. Cl.[7] **H04B** *1/38*

U.S. Cl. 455—575 **36 Claims**

1. A radio communication apparatus for performing communication within a plurality of communication networks, each communication network having at least one base station, said radio communication apparatus having a plurality of identification codes including at least a first identification code assigned to said radio communication apparatus in a first communication network and a second identification code assigned to said radio communication apparatus in a second communication network different from said first communication network, said radio communication apparatus comprising:

fixed storing means for storing some of the plurality of identification codes;



detachable storing means for storing a remainder of the plurality of identification codes;

means for receiving an incoming calling signal which includes any of said plurality of identification codes and which is transmitted from any base station of any one of said plurality of communication networks;

means for designating one of said plurality of identification codes stored in said fixed storing means and said detachable storing means; and

means for transmitting an outgoing calling signal via at least one of the at least one base station of the communication network to which the designated identification code is assigned, and

wherein all parts of the radio communication apparatus, including a mount portion for detachably mounting said detachable storing means, are integrated and housed in a common housing.

6,041,245

HIGH POWER SUPERCONDUCTIVE CIRCUITS AND METHOD OF CONSTRUCTION THEREOF

Raafat R. Mansour, Waterloo, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed Dec. 22, 1995, Appl. No. 577,156

Claims priority, application United Kingdom, Dec. 28, 1994, 9426294

Int. Cl.[7] **H01P** *3/08;* **H01B** *12/02*

U.S. Cl. 505—210 **18 Claims**

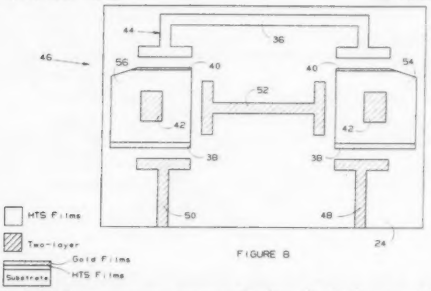


FIGURE 8

1. A high temperature superconductive circuit for use with microwave devices, said circuit having high power handling capability and comprising:

(a) a substrate and a high temperature superconductive film on said substrate;

(b) means to reduce current density in certain portions of said high temperature superconductive film on top of part of said superconductive film, said means to reduce current density extending over part of said circuit leaving at least a substantial portion of said superconductive film exposed;

(c) said circuit having an input and output;

(d) said superconductive film and said means to reduce current density being configured to be in direct contact so that current can flow through said circuit between said input and said output when a signal is applied to said input.

6,041,246

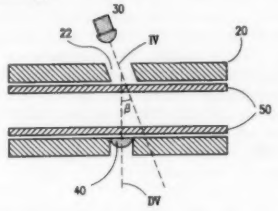
SINGLE LIGHT SENSOR OPTICAL PROBE FOR MONITORING BLOOD PARAMETERS AND CARDIOVASCULAR MEASUREMENTS

Nikolai M. Krivitski, and Dimitry M. Starostin, both of Ithaca, N.Y., assignors to Transonic Systems, Inc., Ithaca, N.Y.

Filed Oct. 14, 1997, Appl. No. 950,244

Int. Cl.[7] **A61B** *5/00*

U.S. Cl. 600—322 **15 Claims**



10. A method for measuring blood parameters in a blood system having a vascular portion, the method comprising:

(a) connecting an extracorporeal portion to the vascular portion at an upstream end and connecting the extracorporeal portion to the vascular portion at a downstream end, the extracorporeal portion including a light transmissive section;

(b) introducing an indicator bolus upstream of an optical sensor in the extracorporeal portion;

(c) determining a photometric property of diluted blood in the extracorporeal portion; and

(d) determining a blood characteristic corresponding to the diluted photometric property of the blood.

6,041,247

NON-INVASIVE OPTICAL MEASURING SENSOR AND MEASURING METHOD

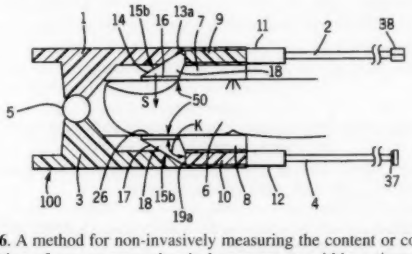
Kurt P. Weckstrom, Espoo, and Kimmo J. Ristolainen, Helsinki, both of Finland, assignors to Instrumentarium Corp, Helsinki, Finland

Continuation-in-part of application No. 08/757,270, Nov. 29, 1996, abandoned. This application Dec. 9, 1998, Appl. No. 208,171.

Claims priority, application Finland, Nov. 29, 1995, 955758

Int. Cl.[7] **A61B** *5/00*

U.S. Cl. 600—323 **41 Claims**



36. A method for non-invasively measuring the content or composition of one or more chemical components within a tissue or body portion, said method comprising the steps of:

emitting radiation having at least two wavelengths suitable for carrying out the measurement;

applying the radiation to a surface of a selected portion of the patient's body;

detecting radiation from a surface of the selected portion of the patient's body, the radiation evincing a property of the received radiation indicative of the chemical component;

providing a signal indicative of the chemical component content or composition; and

subjecting the radiation at a point outside the selected portion of the patient's body to diffusive reflection by applying the

radiation to a surface having diffuse reflection properties approaching those of a Lambertian surface so that generally uniform scattering of the radiation by the diffusively reflective surface predominates.

6,041,248

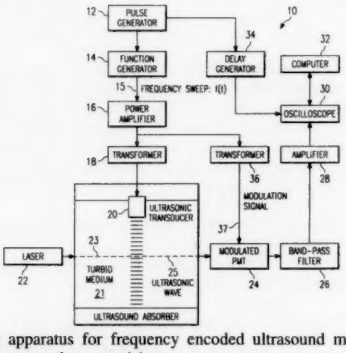
METHOD AND APPARATUS FOR FREQUENCY ENCODED ULTRASOUND-MODULATED OPTICAL TOMOGRAPHY OF DENSE TURBID MEDIA

Lihong Wang, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.

Provisional application No. 60/045,918, May 7, 1997. This application Oct. 22, 1997, Appl. No. 955,671.

Int. Cl.[7] **A61B** *5/00*

U.S. Cl. 600—407 **28 Claims**



1. An apparatus for frequency encoded ultrasound modulated optical tomography comprising:

a function generator operable to produce a frequency sweep signal;

an ultrasonic transducer coupled to the function generator and operable to produce an ultrasonic wave in a turbid medium in response to the frequency sweep signal;

a laser, located outside the turbid medium and operable to send a coherent beam of light into the turbid medium;

a photo multiplier tube located outside the turbid medium and operable to detect light from the laser that has traveled through the turbid medium and that has been modulated by the ultrasonic wave; and

an oscilloscope operable to display the output of the photo multiplier tube wherein differences in the oscilloscope display is indicative of an abnormality in the turbid medium.

6,041,249

DEVICE FOR MAKING A GUIDE PATH FOR AN INSTRUMENT ON A PATIENT

Judith Regn, Nuremburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 4, 1998, Appl. No. 34,565

Claims priority, application Germany, Mar. 13, 1997, 197 10 493; Jan. 16, 1998, 198 01 446

Int. Cl.[7] **A61B** *6/00*

U.S. Cl. 600—429 **4 Claims**

1. A device for use with a tomography apparatus, said device marking a guide path on a patient for an instrument, said device comprising:

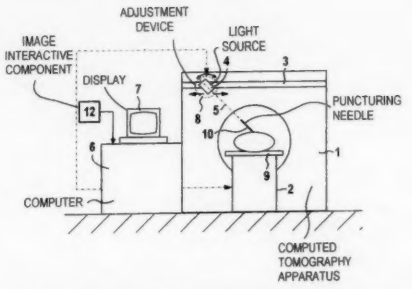
means for producing a planning image of a slice of a patient;

a single light source which emits only a single laser line beam;

means for mounting said light source and for positioning said light source relative to the patient;

a table on which the patient is supported; and

means for defining, in said planning image, a guide path proceeding intracorporeally into the patient for an interventional



instrument and means for automatically displacing at least ne of said light source, via said means for mounting, and said table for positioning said laser line beam relative to said patient so that said laser line beam is co-linear with the guide path defined in said planning image so that said laser line beam forms a visual guide for conducting an interventional procedure.

6,041,250

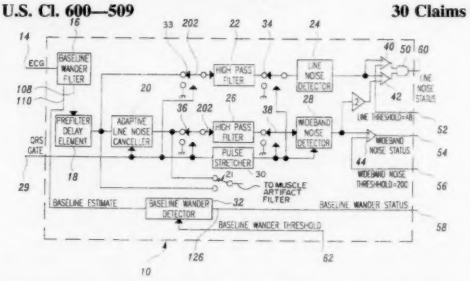
ADAPTIVE LINE NOISE CANCELER AND DETECTOR FOR ECG SIGNALS

Victor M. dePinto, Kirkland, Wash., assignor to Quinton Instruments Company, Bothell, Wash.

Provisional application No. 60/047,253, May 21, 1997. This application May 20, 1998, Appl. No. 81,890.

Int. Cl.[7] **A61B** *5/402*

U.S. Cl. 600—509 **30 Claims**



16. A device for detecting and removing noise from an ECG signal comprising:

an ECG signal input for receiving an ECG signal from a patient;

an ECG gate signal which has a portion of said ECG signal blanked from a point in time just prior to the onset of the QRS portion of said ECG signal and ending at a point in time just after the end of the QRS portion;

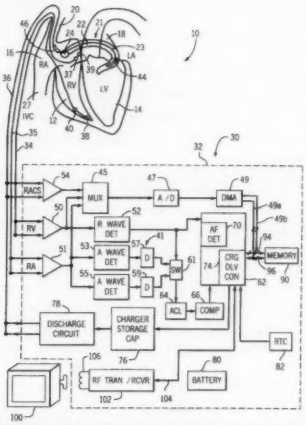
a filter connected to said ECG input for removing contamination from said ECG signal; and

an adaptive line noise canceler for removing line noise from said ECG signal wherein said adaptive line noise canceler receives said ECG signal and said ECG gate signal and adjusts to said ECG signal from said ECG input to remove varying amounts of said line noise from said ECG signal.

6,041,251
SYSTEM AND METHOD FOR DETECTING ATRIAL EVENTS OF A HEART

Jaeho Kim, Redmond, and Joseph M. Bocek, Seattle, both of Wash., assignors to Cardiac Pacemakers, Inc., Minneapolis, Minn.

Filed Jul. 1, 1998, Appl. No. 108,898
Int. Cl.[7] A61B *5/046*
U.S. Cl. 600—518 **9 Claims**



9. A method of detecting atrial events of a heart, the method including the steps of:

sensing atrial activity of the heart;

sensing ventricular activity of the heart;

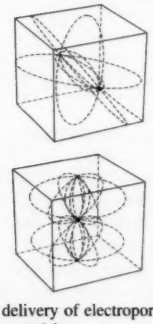
detecting R waves from the sensed ventricular activity; and

detecting A waves from the sensed atrial activity with a first threshold and detecting A waves from the sensed atrial activity with a second threshold higher than the first threshold during detected R waves.

6,041,252
DRUG DELIVERY SYSTEM AND METHOD

Jeffrey P. Walker, San Diego, and Robert M. Bernard, Rancho Santa Fe, both of Calif., assignors to Ichor Medical Systems Inc., San Diego, Calif.

Filed Jun. 7, 1995, Appl. No. 476,714
Int. Cl.[7] A61N *1/30*
U.S. Cl. 604—20 **12 Claims**



1. A system for the delivery of electroporation-inducing electrical fields to a patient comprising:

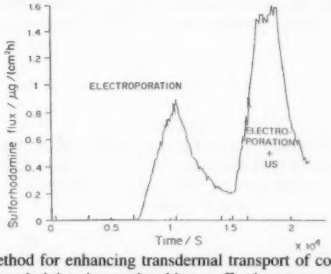
a plurality of electrodes adapted to be located within a predetermined three-dimensional space in a patient, said electrodes arranged to provide at least one reference electrode in electrically--conductive communication with at least two geometrically-oriented satellite electrodes; and

electrical pulse generating means for generating electroporation-inducing electrical fields incorporating control means connected to at least three of said plurality of electrodes said control means capable of varying the number and order of electrodes that participate in each pulse delivered by said pulse generating means such that a pulse many be delivered to at least said reference electrode and at least two of said satellite electrodes simultaneously.

6,041,253
EFFECT OF ELECTRIC FIELD AND ULTRASOUND FOR TRANSDERMAL DRUG DELIVERY

Joseph Kost, Omer, Israel; Uwe Pliquett, Leipzig, Germany; Samir S. Mitragotri, Somerville, Mass.; Robert S. Langer, Newton, Mass., and James C. Weaver, Sudbury, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of application No. 08/574,377, Dec. 18, 1995. This application Apr. 1, 1996, Appl. No. 626,021.
Int. Cl.[7] A61N *1/30*
U.S. Cl. 604—20 **10 Claims**



1. A method for enhancing transdermal transport of compounds comprising administering to the skin an effective amount of ultrasound at a frequency of less than 2.5 MHz to permeabilize the skin followed by an enhancer selected from the group consisting of electroporation, vacuum or mechanical pressure.

6,041,254
H-BRIDGE CIRCUIT FOR GENERATING A HIGH-ENERGY BIPHASIC WAVEFORM IN AN EXTERNAL DEFIBRILLATOR AND FURTHER INCLUDING A PROTECTIVE COMPONENT THAT HAS BOTH INDUCTIVE AND RESISTIVE PROPERTIES

Joseph L. Sullivan; Lawrence A. Borschowa, and Richard C. Nova, all of Kirkland, Wash., assignors to Physio-Control Manufacturing Corporation, Redmond, Wash.

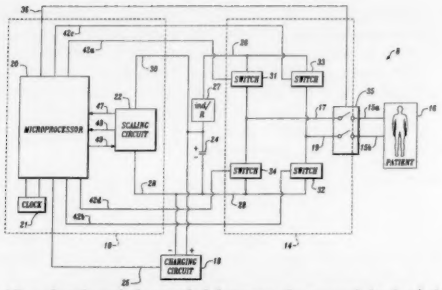
Continuation-in-part of application No. 08/811,833, Mar. 5, 1997, Pat. No. 5,824,017. This application Mar. 5, 1998, Appl. No. 35,690.
This patent is subject to a terminal disclaimer.
Int. Cl.[7] A61N *1/39*
U.S. Cl. 607—5 **20 Claims**

1. An output circuit and a resistive component in an external defibrillator with a control circuit for switchably coupling an energy storage capacitor storing at least approximately 200 joules of energy and having a first lead and a second lead with a first and second electrode coupled to a patient in order to conduct the energy stored in the energy storage capacitor to the patient, the output circuit being coupled to the energy storage capacitor by a circuit path, the output circuit and resistive component comprising:

(a) a first switch coupled between the first lead of the energy storage capacitor and the first electrode;

(b) a second switch coupled between the second lead of the energy storage capacitor and the second electrode;

(c) a third switch coupled between the first lead of the energy storage capacitor and the second electrode;



(d) a fourth switch coupled between the second lead of the energy storage capacitor and the first electrode;

(e) the resistive component coupled within the circuit path between the energy storage capacitor and the output circuit, the resistive component limiting the current flow between the energy storage capacitor and the output circuit; and

(f) the second and third switches placed by the control circuit in a conducting state during an internal energy dump operation to shunt energy from the energy storage capacitor, the current through the second and third switches during the internal energy dump operation being limited by the resistive component.

6,041,255

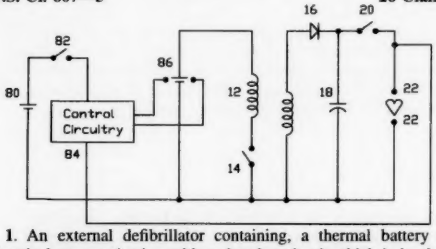
DISPOSABLE EXTERNAL DEFIBRILLATOR

Mark W. Kroll, 2056 Shoreline Dr., Orono, Minn. 55391

Filed Apr. 16, 1998, Appl. No. 61,755

Int. Cl.[7] A61N *1/39*

U.S. Cl. 607—5 **20 Claims**



1. An external defibrillator containing, a thermal battery in electrical communication with a charging circuit which is in electrical communication with a capacitor, output circuitry connected to the capacitor and to electrode connections, control circuitry connected to the battery, charging circuit, output circuit and electrodes such that the control circuitry, once sensing a pathologic arrhythmia through the electrodes, will allow the thermal battery to charge the capacitor through the charging circuitry and deliver a shock from the capacitor to the electrode connections.

6,041,256

DEVICE FOR THE TRANSVENOUS CARDIOVERSION OF ATRIAL FIBRILLATION OR ATRIAL FLUTTER

Ulrich Michel, Kaiserslautern, Germany, assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of application No. 08/807,519, Feb. 27, 1997, Pat. No. 5,913,887. This application Jun. 9, 1999, Appl. No. 328,336.

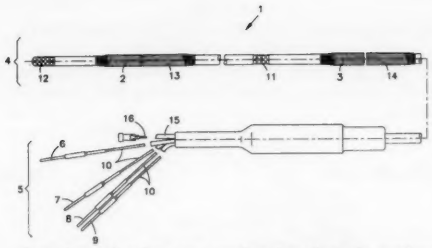
Claims priority, application Germany, Mar. 1, 1996, 296 03 805 U

Int. Cl.[7] A61N *1/39*

U.S. Cl. 607—5 **19 Claims**

1. A method, comprising:

implanting a transvenous catheter in an atrial position, where the transvenous catheter induces at least two defibrillation coil



electrodes and at least one sensing ring electrode positioned between the at least two defibrillation coil electrodes;

monitoring a first cardiac potential between the at least one sensing ring electrode and one of the at least two defibrillation coil electrodes;

analyzing the first cardiac potential for the occurrence of an atrial arrhythmia; and

delivering atrial defibrillation energy after the atrial arrhythmia occurs.

6,041,257

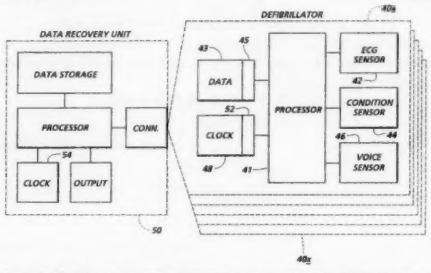
METHOD OF USING A MEASURING INSTRUMENT AND DATA GATHERING SYSTEM

Ian G MacDuff, Bothell; Daniel J Powers, and Clinton S Cole, both of Issaquah, all of Wash., assignors to Heartstream, Seattle, Wash.

Division of application No. 09/075,999, May 11, 1998, which is a continuation-in-part of application No. 08/649,414, May 16, 1996, Pat. No. 5,749,913, which is a continuation-in-part of application No. 08/314,395, Sep. 28, 1994, Pat. No. 5,549,115. This application Jul. 19, 1999, Appl. No. 358,134.

Int. Cl.[7] A61N *1/39*

U.S. Cl. 607—5 **1 Claim**



1. A defibrillator system comprising an external defibrillator and a main data recovery unit, wherein,

the defibrillator comprises electrodes, an energy source and a controller, the controller comprising an ECG signal analyzer and a clock for associating time information with an ECG signal, communication hardware for communication to the main data recovery unit, and means for local actuation of the defibrillator to deliver an electrical pulse from the energy source to the electrodes,

the main data recovery unit having communication hardware for receiving information from the defibrillator,

wherein the defibrillator collects information and then transmits the information to the main data recovery unit for error analysis using a mathematical model.

6,041,258

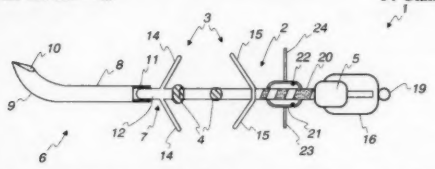
MEDICAL STIMULATION

Valerio Cigaina, Treviso, Italy, and David Jenkins, Bennington, N.J., assignors to Transneuronix, Inc., Mount Arlington, N.J.

Continuation-in-part of application No. PCT/US98/10402, May 21, 1998. This application Jul. 27, 1998, Appl. No. 122,832.

Int. Cl.[7] A61N *1/05;1/36*

U.S. Cl. 607—40 **14 Claims**



1. An implant device adapted for electrostimulation or electrical monitoring of tissue to be treated within the endo-abdominal cavity, said implant device comprising (1) an elongated body having a distal end and a proximal end, (2) a penetration mechanism at the distal end of the elongated body to penetrate the tissue to be treated, (3) a quick release connecting mechanism adjacent to the penetration mechanism, (4) a first and second sets of flexible tines adjacent and proximal to the quick release connecting mechanism to secure the implant device to the tissue to be treated wherein the first and second sets of tines are spaced apart along the elongated body a distance sufficient to span the tissue such that the first set of tines are located between the quick release connecting mechanism and the second set of tines, (5) at least two electric poles located between the two sets of flexible tines, (6) an electrical connection terminal at the proximal end of the elongated body for connection to a power source, and (7) a relatively hard, elongated handle having a proximal end and a distal end which can be attached to the proximal end of the elongated body;

wherein the two or more electric poles are electrically connected to electrical connection terminal; wherein the quick release connecting mechanism is effective to separate the penetration device from the elongated body once the implant device is properly positioned in the endo-abdominal cavity; wherein the distal end of the handle is adapted for attachment to the proximal end of the elongated body and the proximal end of the handle has grasping means whereby the handle can be grasped and manipulated using forceps; and wherein the handle can be easily separated from the proximal end of the elongated body at a desired time.

6,041,259

EXTERNALLY WORN MEDICAL DEVICE

Poonam Agarwala, New Brighton, and Andrzej M. Malewicz, New Hope, both of Minn., assignors to Empi, Inc., St. Paul, Minn.

Filed Dec. 12, 1997, Appl. No. 990,080

Int. Cl.[7] A61N *1/00*

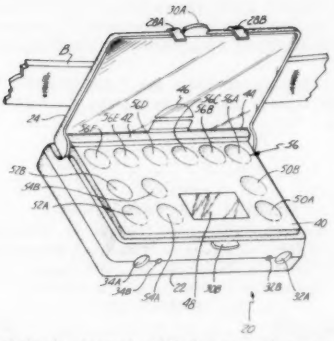
U.S. Cl. 607—46 **4 Claims**

1. A transcutaneous electrical nerve stimulation (TENS) device which is connected to TENS electrodes applied to a patient, which is worn by a patient and which allows the patient to control pain treatment while storing information used to evaluate the effectiveness of the pain treatment: the TENS device comprising:

a case;

a control panel including a display and a plurality of inputs, the control panel being mounted on the case wherein the plurality of inputs include intensity control inputs which allow the patient to regulate intensity of treatment being administered, pre-programmed selection inputs which allow the patient to select from a number of pre-programmed treatment regimens, and a pain intensity scale which allows the patient to input a level of perceived pain;

a plurality of output terminals at a surface of the case for connection to TENS electrodes;



electrical circuitry housed within the case and connected to the control panel, the inputs and the output terminals for controlling electrical stimulation supplied to the output terminals based upon a regimen and an intensity selected, and for storing data relating to pain levels;

a cover pivotally connected to the case;

a clip on the cover for attaching the cover to a patient's clothing so that the cover is generally vertical;

a latch for holding the case in a closed position adjacent the cover with the control panel generally vertical and located between the case and the cover, the latch being releasable to allow the case to pivot to a first open position in which the control panel is generally horizontal and is viewable and accessible by the patient; and

a stop element on the case which engages the cover to define the first open position.

6,041,260

METHOD AND APPARATUS FOR ENDOMETRIAL ABLATION

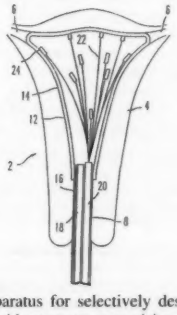
Roger A. Stern, Cupertino; Vincent N. Sullivan, and Robert L. Marion, both of San Jose, all of Calif., assignors to Vesta Medical, Inc., Boulder, Colo.

Continuation of application No. 08/046,683, Apr. 14, 1993, Pat. No. 5,443,470, which is a continuation-in-part of application No. 07/877,567, May 1, 1992, Pat. No. 5,277,201. This application Jun. 7, 1995, Appl. No. 481,940.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] A61N *5/00*

U.S. Cl. 607—98 **14 Claims**



1. An ablation apparatus for selectively destroying tissue of a hollow body organ, said apparatus comprising:

an electroconductive, expandable electrode means for effecting electrical contact with an inner surface of the organ, said expandable electrode means being a bladder provided with a plurality of separate electrodes on a surface of the bladder;

a plurality of temperature sensors, wherein a temperature sensor is associated with each electrode and is mounted in close proximity to its associated electrode;

a radio frequency power means connected to said expandable electrode means for selectively providing power to said electrodes to heat said tissue by passing current through the tissue; and

control means for controlling the power means to heat the selected tissue to a uniform temperature of at least 45° C.

6,041,261

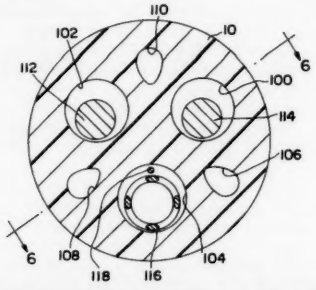
MEDICAL ELECTRICAL LEAD

David D. Verness, Forest Lake; George M. Huepenbecker, Vadnais Heights, and Dale A. Wahlstrom, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 21, 1997, Appl. No. 843,763

Int. Cl.[7] A61N *1/04*

U.S. Cl. 607—122 **35 Claims**



1. An implanted medical lead comprising an elongated lead body having an elongated lumen therein;

an elongated coiled conductor defining an internal lumen and mounted within the lumen of the lead body;

a stranded conductor, extending along the length of the lead body and coupled electrically to the coiled conductor at a first location and a second location distal to and spaced from the first location, said stranded conductor located outside of said internal lumen of said coiled conductor for a distance extending along said lead body.

6,041,262

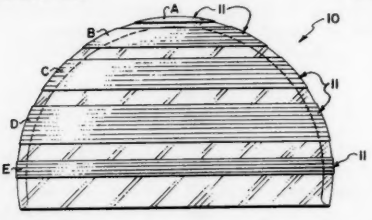
HAIR REGROWTH METHOD AND APPARATUS

Douglas S. Beder, Vancouver, Canada, assignor to 314613 B.C. Ltd., Vancouver, Canada

Filed Apr. 1, 1996, Appl. No. 631,654

Int. Cl.[7] A61N *1/00*

U.S. Cl. 607—139 **4 Claims**



1. An electrode array for a hair regrowth apparatus, said apparatus comprising voltage pulse generator means for electrical coupling to said electrode array for application thereto of a low voltage pulse train having a pulse repetition frequency, and frequency selector means for electrical coupling to said voltage pulse generator means for varying said pulse repetition frequency of said pulse train, said electrode array comprising a plurality of concentric electrically conductive rings applied to an outer surface of an electrically insulating liner insertable within a hood positionable over a subject's head.

6,041,263

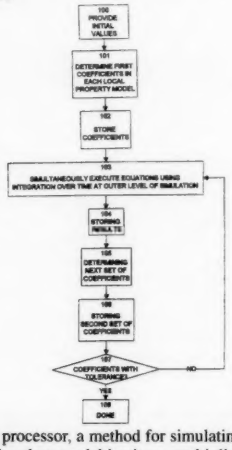
METHOD AND APPARATUS FOR SIMULATING AND OPTIMIZING A PLANT MODEL

Joseph F. Boston, Bedford, Mass., and Ian Boys, Letchworth Herts, United Kingdom, assignors to Aspen Technology, Inc., Cambridge, Mass.

Provisional application No. 60/027,730, Oct. 1, 1996. This application Oct. 1, 1997, Appl. No. 997,056.

Int. Cl.[7] G05B *13/04;13/02;17/02*

U.S. Cl. 700—32 **5 Claims**



1. In a digital processor, a method for simulating and optimizing a plant model, the plant model having a multiplicity of equipment models for a desired processing plant and a multiplicity of local property models for the material components within the plant, comprising the steps of:

a) providing a set of initial values for each unknown variable in the plant model in a data storage area;

b) determining by the digital processor a first set of coefficients in each local property model based on the set of initial values;

c) storing the coefficients in the data storage area;

d) executing simultaneously, in an outer level routine of a simulation routine, by the digital processor, a single, unchanging set of equations representing the equipment models and local property models, wherein said single set of equations is based upon a calculation of integration over time and includes a complementarity flash formulation, and wherein said single set of equations is simultaneously valid in all regions of a solution regardless of the state of the solution, by using the first set of coefficients to determine a second set of values for the plant model;

e) storing the second set of values for the plant model in the data storage area;

f) determining by the digital processor a second set of coefficients in each set of local property model; and

g) storing the second set of coefficients in the data storage area.

6,041,264

DEADBAND CONTROL ASSISTANT ELIMINATING OFFSET FROM SETPOINT

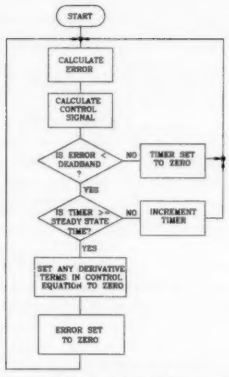
Richard A. Wruck, Mt. Prospect, and Gideon Shavit, Highland Park, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 27, 1997, Appl. No. 789,732

Int. Cl.[7] G05B *13/02*

U.S. Cl. 700—40 **25 Claims**

1. An apparatus for eliminating oscillation in a process during a quasi-steady-state condition, the process being controlled using a normal control device during normal conditions by control signals determined using a control equation, the control equation depending on an error in a measured process output to produce the control



signals and the error defined by the difference between the measured process output, and a desired process output, comprising:

means for determining existence of the quasi-steady-state condition in the process, and;

means for selecting a fixed control signal once the quasi-steady-state condition exists, the quasi-steady-state condition being determined by defining a deadband range around the desired process output, the quasi-steady-state condition being determined to exist when the measured process output enters the deadband range and stays in the deadband range for a predetermined amount of time.

6,041,265

OPERATIONAL CONTROL DEVICE AND METHOD FOR AN IMAGE PROCESSING APPARATUS

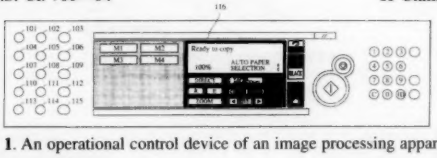
Akio Suzuki, Tokyo; Ei Yamamoto; Toshiyuki Kitamura, both of Yokohama, and Hiroyoshi Yoshida, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1995, Appl. No. 404,563

Claims priority, application Japan, Mar. 16, 1994, 6-045897

Int. Cl.[7] G05B *19/00*

U.S. Cl. 700—84 **11 Claims**



1. An operational control device of an image processing apparatus comprising:

display means;

first display control means for controlling display of a screen for adjusting a single group of color-balance data, which has a plurality of adjustment values for each color component, on said display means,

input means for manually inputting adjustment values of a single group of color-balance data in a condition that said screen is displayed by said first display means;

memory means for storing plural groups of color-balance data;

second display control means for concurrently controlling display of each of said plural groups of color-balance data stored in said memory means on said display means, differently from the screen displayed by said first display control means; and

selection means for selecting the color-balance of the desired group from among said plural groups of color-balance data displayed on said display means.

6,041,266

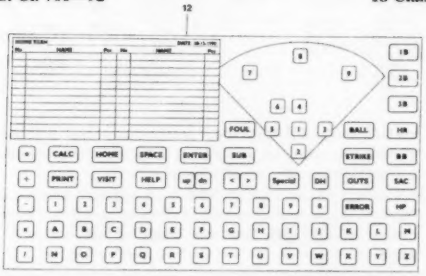
BASEBALL SCOREKEEPER

Danny L. Nickerson, 17636 Teklanika Dr., Eagle River, Ak. 99577

Filed Jan. 14, 1992, Appl. No. 820,261

Int. Cl.[7] G06F *15/28*

U.S. Cl. 700—92 **18 Claims**



1. An electronic baseball scorekeeper, for keeping the score of a real baseball game played by real players on a field, comprising:

a plurality of field position manually operable elements each of which elements is dedicated to a given field position,

a plurality of event manually operable elements each of which elements is dedicated to a single type of game event;

a plurality of manually operable alphabet elements for entry of a list of player names by operating different ones of said alphabet elements for the different letters of the alphabet, respectively, that are entered;

storage means for storing said list of player names, events and statistics;

display means for display of events, said list of player names and statistics,

processor means, including said storage means, and having a first mode for accepting said list of player names from said alphabet elements, a second mode for providing said list to said display, a third mode for entering data from said field position elements and said event elements into said processor means, a fourth mode for calculating statistics including the score and a fifth mode for providing statistical information to said display,

said processor means advancing from player to player on said list as necessary to cause at least a part of said event data and at least a part of said field position data to be provided to said processor means as related to the proper player on said list.

6,041,267

METHOD TO PROVIDE COMMON SUPPORT FOR MULTIPLE TYPES OF SOLVERS FOR MATCHING ASSETS WITH DEMAND IN MICROELECTRONICS MANUFACTURING

Geetaram S. Dangat, Naperville, Ill.; Robert J. Milne, Jericho, and Robert A. Orzell, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1997, Appl. No. 938,753

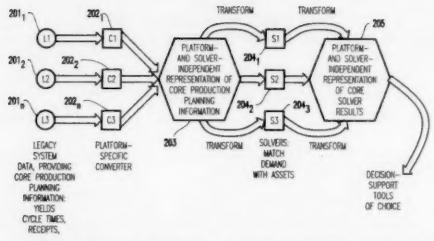
Int. Cl.[7] G06F *19/00*

U.S. Cl. 700—107 **12 Claims**

1. A computer implemented decision support method which matches assets with demands to determine which demands can be met in what time frame, identifies production activities necessary to meet the demand, and creates a projected supply plan to generate different outputs for use in generating a production plan, comprising the steps of:

establishing a first comprehensive detailed data base to represent and store production specification information that includes manufacturing specifications, asset status, and business guidelines;

establishing a second comprehensive detailed data base to represent and store matching solutions including all required


TRANSFORM
TRANSFORM
LEGACY SYSTEM DATA, PROVIDING CORE PRODUCTION PLANNING INFORMATION YIELDS, CYCLE TIMES, RECEIPTS,
PLATFORM-SPECIFIC CONVERTER
PLATFORM- AND SOLVER-INDEPENDENT REPRESENTATION OF CORE PRODUCTION PLANNING INFORMATION
TRANSFORM
SOLVERS: MATCH DEMAND WITH ASSETS
TRANSFORM
PLATFORM- AND SOLVER-INDEPENDENT REPRESENTATION OF CORE SOLVER RESULTS
DECISION-SUPPORT TOOLS OF CHOICE

manufacturing activities, their quantity, and their start date, wherein the solutions are produced by iteratively selecting and running any of a set of solvers;

capturing and storing core production specification information from various sources and storing them in said first comprehensive detailed data base in a single format and level of detail;

specifying initial production specification information from said first comprehensive detailed data base;

iteratively selecting and running one or more of said set of solvers based upon examination of previous iteration results, said set of solvers commonly accessing the initially specified or a newly specified production specification information from said first comprehensive detailed data base, said set of solvers including: Advanced Material Requirements Planning (AMRP) that uses a series of integrated Linear Programming and MRP methods to explode demand backwards through a bill of material and assets across multiple manufacturing facilities, Best Can Do (BCD) that matches demand against manufacturing capability across a bill of material supply chain and indicates when end item customer demand is satisfied, and Projected Supply Planning (PSP) that executes a forward flush of starts and work in progress and compares projected supply with demand;

generating different outputs based on said iteratively selecting and running step for each solver; and

determining a production plan based on one or more of the different outputs generated by said iteratively selecting and running step, wherein the different outputs of said set of solvers and said production plan are stored in common data areas of said second comprehensive detailed data base in a common format that is accessible by other solvers and other applications.

6,041,268

METHOD FOR TRANSFORMING ORIGINAL BILL-OF-MATERIAL FOR PRINTED CIRCUIT BOARD INTO STANDARD BILL-OF-MATERIAL

Sang-Hun Jin, Daekukwangyok-Shi, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 8, 1999, Appl. No. 227,713

Claims priority, application Rep. of Korea, Jun. 27, 1998, 98-24596

Int. Cl.[7] G06F *19/00*

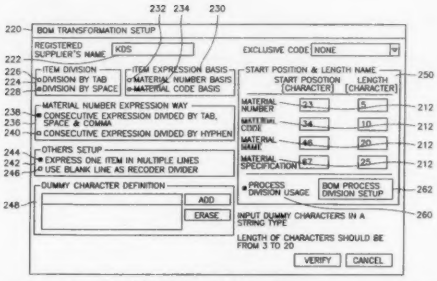
U.S. Cl. 700—107 **8 Claims**

1. In a programmed computer system having a display device for preparing a working plan for inserting a plurality of materials into a printed circuit board, a method for transforming an original bill-of-material made by a material supplier into a standard bill-of-material, comprising the steps of:

storing the original bill-of-material in a first storage area of the programmed computer system;

registering field configuration information of the original bill-of-material, the field configuration information including field division way information, field expression way information, field position information, and field length information;

inputting a bill-of-material transforming command;



in response to the bill-of-material transforming command, transforming material information of the original bill-of-material stored in the first storage area into the standard bill-of-material; and

storing the transformed material information in a second storage area allotted to a standard bill-of-material area.

6,041,269

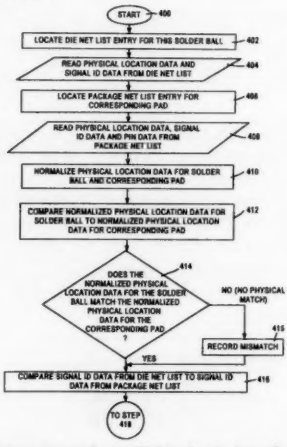
INTEGRATED CIRCUIT PACKAGE VERIFICATION

Alexander C. Tain, Milpitas, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 11, 1997, Appl. No. 909,463

Int. Cl.[7] G06F *19/00*

U.S. Cl. 700—121 **9 Claims**


START
LOCATE DIE NET LIST ENTRY FOR THIS SOLDER BALL
READ PHYSICAL LOCATION DATA AND SIGNAL ID DATA FROM DIE NET LIST
LOCATE PACKAGE NET LIST ENTRY FOR CORRESPONDING PAD
READ PHYSICAL LOCATION DATA, SIGNAL ID DATA AND PIN DATA FROM PACKAGE NET LIST
NORMALIZE PHYSICAL LOCATION DATA FOR SOLDER BALL AND CORRESPONDING PAD
COMPARE NORMALIZED PHYSICAL LOCATION DATA FOR SOLDER BALL TO NORMALIZED PHYSICAL LOCATION DATA FOR CORRESPONDING PAD
DOES THE NORMALIZED PHYSICAL LOCATION DATA FOR THE SOLDER BALL MATCH THE NORMALIZED PHYSICAL LOCATION DATA FOR THE CORRESPONDING PAD ?
NO (NO PHYSICAL MATCH)
RECORD MISMATCH
YES
COMPARE SIGNAL ID DATA FROM DIE NET LIST TO SIGNAL ID DATA FROM PACKAGE NET LIST
TO STEP 418

9. A computer system for verifying the design of an integrated circuit (IC) package in an IC assembly, the computer system including one or more processors and a memory containing:

a) physical interface data indicative of a physical interface between an IC die to be included in the IC assembly and the package, wherein the physical interface data includes

i) a set of die connector location data indicative of the physical location of a set of electrical conductors associated with the IC die, and

ii) a set of package connector location data indicative of the physical location of a first set of electrical conductors associated with the package;

b) a first set of signal interface data indicative of a signal interface between the IC die and the package, wherein the first set of signal interface data includes

i) a set of die connector signal data indicative of signals associated with each of the set of electrical conductors associated with the IC die, and

ii) a first set of package connector signal data indicative of signals associated with each of the first set of electrical conductors associated with the package;

c) a second set of signal interface data indicative of a signal interface between the package and a socket to be used with the IC assembly, wherein the second set of signal interface data includes

i) a second set of package connector signal data indicative of signals associated with a second set of electrical conductors associated with the package, and

ii) a set of socket connector signal data indicative of signals associated with a set of electrical conductors associated with the socket; and

d) a plurality of instructions which when executed by the one or more processors cause the one or more processors to perform the steps of

i) verify a physical interface between the IC die and the package,

ii) verify a signal interface between the IC die and the package, and

iii) verify a signal interface between the package and the socket.

6,041,270

AUTOMATIC RECIPE ADJUST AND DOWNLOAD BASED ON PROCESS CONTROL WINDOW

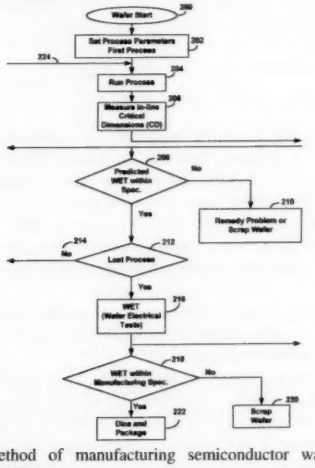
Paul J. Steffan, Elk Grove, and Ming Chun Chen, Milpitas, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 5, 1997, Appl. No. 985,470

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H01L** *21/66;* **G06F** *19/00*

U.S. Cl. 700—121 **3 Claims**



1. A method of manufacturing semiconductor wafers, the method comprising:

starting a wafer lot in a first process of a manufacturing process;

setting process parameters for the first process and running the first process;

measuring in-line critical dimensions after completion of the first process and determining a set of predicted wafer electrical test measurement;

comparing the set of predicted wafer electrical test measurements with a set of target wafer electrical test measurements and determining a set of optimized process parameters for equipment for a next process;

comparing the set of optimized process parameters for the next process with a set of equipment characteristics and adjusting a set of process parameters for the next process; and

downloading the adjusted set of process parameters into the equipment for the next process.

6,041,271

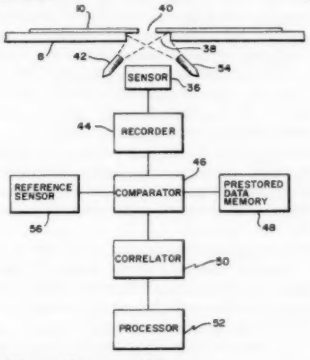
APPARATUS TO DETERMINE THE OPERATIONAL EFFECTIVENESS OF A MACHINE TOOL AND METHOD THEREFOR

Mikko Lindstrom, Streamwood, Ill., assignor to Finn-Power International, Inc., Schaumburg, Ill.

Filed Oct. 10, 1991, Appl. No. 773,319

Int. Cl.[7] **G06F** *19/00*

U.S. Cl. 700—175 **35 Claims**



1. A machining station, comprising:

a frame;

a turret rotatably and movably coupled to said frame;

a worktable positioned relative to said turret and onto which a worksheet is placed;

at least one tool means mounted to said turret, said tool means effective for making openings on said worksheet;

means positioned proximately to said tool means to detect each successive opening, if any, made by said tool means on said worksheet; and

control means for either stopping the operation of said machining station or rotating said turret to replace said tool means with another tool means when said detect means fails to detect any such successive opening on said worksheet.

6,041,272

DESULFURIZATION PROCESS FOR FLUE GASES

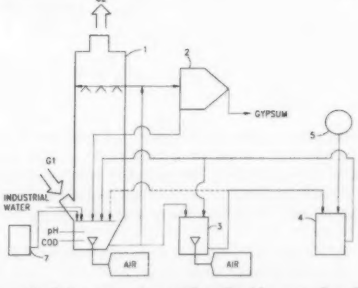
Hideyuki Michiki; Hisashi Miyakawa, and Kozo Ohsaki, all of Chiba, Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Jun. 12, 1998, Appl. No. 97,114

Claims priority, application Japan, Jun. 24, 1997, 9-167469; Mar. 19, 1998, 10-070335

Int. Cl.[7] **G05B** *1/00*

U.S. Cl. 700—266 **16 Claims**



1. A method for removing sulfur dioxide out of a flue gas containing sulfur dioxide, comprising the steps of:

(a) desulfurizing a flue gas containing sulfur dioxide by contacting the flue gas with a desulfurizing liquid containing magnesium components in a desulfurization column, wherein the

sulfur dioxide is absorbed, in the form of magnesium salts including magnesium sulfite and magnesium bisulfite, by the desulfurizing liquid;

(b) oxidizing with an oxygen-containing gas the desulfurization reaction liquid containing magnesium salts discharged from the desulfurization column, in an oxidation vessel, wherein the magnesium salts are converted to magnesium sulfate and sulfuric acids;

(c) neutralizing with a basic calcium compound in a double decomposition vessel the oxidized liquid containing the magnesium sulfate and sulfuric acid discharged from the oxidation vessel, wherein gypsum and magnesium hydroxide are formed in the oxidized liquid which is in the form of a slurry;

(d) recycling the slurry containing gypsum and magnesium hydroxide to the desulfurization and optionally to the oxidation vessel, wherein the magnesium hydroxide is used as a desulfurizing agent in step (a), wherein the desulfurization reaction liquid comprises magnesium hydroxide, gypsum, magnesium sulfite, magnesium bisufite, sulfuric acid, and magnesium sulfate, wherein sulfite ions and calcium ions are present;

(e) separating gypsum from at least either the desulfurization reaction liquid discharged from the desulfurization column or the oxidized liquid discharged from the oxidation vessel; and

(f) measuring the flow and composition of the flue gas introduced into the desulfurization column in step (a) and the flow of the desulfurization reaction liquid discharged from the desulfurization column to estimate subsequent values of pH and magnesium sulfate concentration of the desulfurization reaction liquid in the desulfurization column;

(g) comparing the estimated subsequent values with predetermined constant target values to determine discrepancies; and

(h) conducting at least one of (i), (ii), or (iii) to minimize the discrepancies:

(i) controlling the flow of the slurry in step (c) fed to the double decomposition vessel;

(ii) controlling the flow of the recycling slurry in step (d);

(iii) adding magnesium hydroxide to the desulfurization column in step (a).

6,041,273

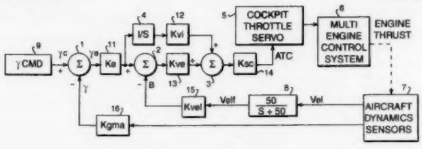
EMERGENCY CONTROL AIRCRAFT SYSTEM USING THRUST MODULATION

John J. Burken, Tehachapi, and Frank W. Burcham, Jr., Lancaster, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 1, 1997, Appl. No. 886,656

Int. Cl.[7] B64C *19/00*

U.S. Cl. 701—3 **9 Claims**



1. An emergency control servo system for using thrust modulation for longitudinal control of a multiengine aircraft having a throttle servo for control of all engines in unison, comprising

means for independently entering a flightpath angle command to be maintained and producing a flightpath angle command signal γc,

means for continually sensing said aircraft flightpath angle and producing a flightpath angle signal γ,

means for producing a flightpath error signal γe as a fiction of the difference between said flightpath angle command γc and said sensed aircraft flightpath angle γ,

means for forming a limited integral as a function of said error signal and

means for adding said integral to said error signal for producing an output control signal for said throttle servo, thereby to adjust thrust of said engines to reduce said error signal γe toward zero.

6,041,274

POSITIONAL DEVIATION DETECTING DEVICE FOR A MOBILE BODY AND POSITION CORRECTING APPARATUS FOR A WORKING MACHINE MOUNTED ON A MOBILE BODY

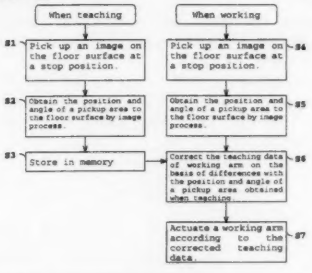
Masanori Onishi; Masanao Murata; Yutaka Nakai; Katsumi Yasuda; Tsukasa Sugino; Susumu Nakagawa, all of Ise, and Kouji Miura, Toyohashi, all of Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1998, Appl. No. 63,409

Claims priority, application Japan, Apr. 21, 1997, 9-103301; Dec. 9, 1997, 9-338529; Dec. 9, 1997, 9-338530; Jan. 23, 1998, 10-011311; Feb. 18, 1998, 10-036064

Int. Cl.[7] G05D *1/00*

U.S. Cl. 701—26 **31 Claims**


When teaching
When working
S1
Pick up an image on the floor surface at a stop position.
S4
Pick up an image on the floor surface at a stop position.
S2
Obtain the position and angle of a pickup area to the floor surface by image process.
S5
Obtain the position and angle of a pickup area to the floor surface by image process.
S3
Store in memory
S6
Correct the teaching data of working arm on the basis of differences with the position and angle of a pickup area obtained when teaching
S7
Actuate a working arm according to the corrected teaching data.

1. A position correcting apparatus for a working machine mounted on a mobile body for stopping said mobile body at a predetermined work position on a floor with a regular pattern formed thereon, and allowing said working machine to perform a predetermined operation according to teaching data, previously prepared and given to said working machine with said mobile body stopped at a reference stop position at said work position, comprising:

image pickup means, provided on said mobile body side at a position near said floor, for picking up an image on said floor where said mobile body stops;

reference picked image acquiring means for, at a time of giving said teaching data to said working machine, for acquiring a reference picked image including an image of said regular pattern and an image of a identification mark provided on said floor in vicinity of said predetermined work position, both acquired by said image pickup means with said mobile body stopped at said reference stop position of said work position;

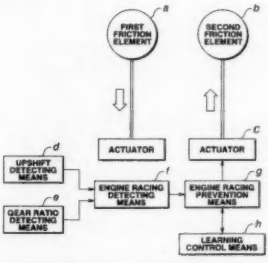
on-pause picked image acquiring means for acquiring an on-pause picked image including images of said regular pattern and said identification mark acquired by said image pickup means at a stop position of said mobile body when stopped; and

teaching data correction means for comparing said regular pattern in said reference picked image, obtained by said reference picked image acquiring means, with said regular pattern in said on-pause picked image, obtained by said on-pause picked image acquiring means, based on a position of said identification mark, and correcting said teaching data of said working machine based on a result of the comparison.

6,041,275
AUTOMATIC TRANSMISSION UPSHIFT CONTROL APPARATUS

Masahiro Takiguchi, Shizuoka, Japan, assignor to Jatco Corporation, Fuji, Japan

Filed Dec. 15, 1997, Appl. No. 990,844
Claims priority, application Japan, Dec. 19, 1996, 8-339229
This patent is subject to a terminal disclaimer.
Int. Cl.[7] B60K *28/16;* **F16H** *61/08*
U.S. Cl. 701—55 **9 Claims**



1. An upshift control apparatus for use in an automatic transmission having an input shaft drivingly coupled to an engine and first and second torque transmitting elements operable on fluid pressure between engaged and released conditions for controlling at least the fluid pressure to the second element to an initial value to engage the second element to effect an upshift from a current gear ratio to a higher target gear ratio while releasing the first element without the use of a one-way clutch to release the first element while synchronizing rotation, comprising:

means for detecting an upshift in the transmission;

means for detecting the gear ratio changing during the upshift;

means operable after the upshift is detected for detecting engine racing when the detected gear ratio is equal to or greater than a threshold value greater than a gear ratio existing before the upshift; and

engine racing prevention means for increasing the fluid pressure supplied to the second element to prevent the engine racing when the engine racing is detected at an early stage of the upshift before an inertia phase of the upshift.

6,041,276
DEVICE FOR CONTROLLING A STARTING PROCEDURE

Thomas John, Alitzheim; Thomas Kuhn, Bad Kissingen, and Wolfgang Nehse, Reichling/Ludenhausen, all of Germany, assignors to Mannesman Sachs AG, Schweinfurt, and BMW AG, München, both of Germany

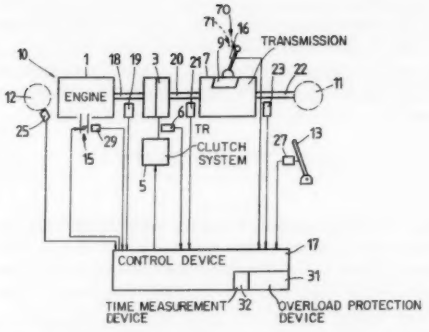
Filed Dec. 18, 1997, Appl. No. 992,981
Claims priority, application Germany, Dec. 21, 1996, 196 53 855
Int. Cl.[7] F16D *48/08*
U.S. Cl. 701—67 **22 Claims**

1. A device for controlling a starting procedure of a motor vehicle by controlling an automatic friction clutch of the motor vehicle, comprising:

a controller operatively connected for receiving signals from an engine shaft speed sensor, a vehicle speed sensor, a transmission shaft speed sensor, a transmission output shaft speed sensor, and an accelerator pedal position sensor;

a racing start device operatively connected to said controller for generating a racing start desire signal and a starting time point signal in response to an input from a user of the motor vehicle;

said controller operatively connected to an engine of said motor vehicle for producing an engine speed above a minimum engine speed threshold value in response to said racing start desire signal; and

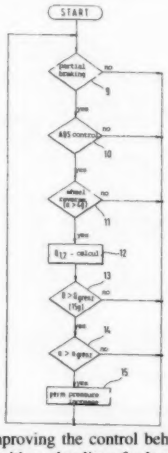


said controller operatively connected to the automatic friction clutch for controlling the automatic friction clutch to produce a first slip of the drive wheels of the motor vehicle and to produce a second slip of the automatic friction clutch in response to said starting time point signal, said controller also operatively connected to the automatic friction clutch for controlling a magnitude of said first slip in response to a speed of the motor vehicle during said starting procedure.

6,041,277
METHOD OF IMPROVING THE CONTROL CHARACTERISTICS OF AN ANTILOCKING SYSTEM (ABS)

Ivica Batistic, Frankfurt am Main, and Robert Schmidt, Rennerod, both of Germany, assignors to ITT Maufacturing Enterprises, Inc., Wilmington, Del.

PCT No. PCT/EP96/02950, § 371 Date Aug. 7, 1998, § 102(e) Date Aug. 7, 1998, PCT Pub. No. WO97/08030, PCT Pub. Date Mar. 6, 1997
PCT Filed Apr. 7, 1996, Appl. No. 11,824
Int. Cl.[7] B60T *8/00*
U.S. Cl. 701—71 **5 Claims**



1. A method of improving the control behavior of an anti-lock system of a vehicle with a plurality of wheels, each wheel being equipped with a wheel brake with an individually contolable braking pressure, wherein the rotational behavior of the individual vehicle wheels is measured and a vehicle reference speed is produced by logically combining the measured quantities, the vehicle reference speed being used as a reference quantity to determine the wheel slip and other control quantities and as a reference quantity for braking pressure control or braking pressure modulation, wherein, upon the commencement of an anti-lock control operation including a brake pressure reduction subsequent to an uncontrolled

braking operation, and upon the occurrence of an acceleration of at least one controlled wheel which is in excess of a predetermined limit value, a quotient Q is produced of a maximum brake slip λ_{max} of the wheel during the anti-lock brake operation and the duration Δt of pressure reduction until the wheel reaccelerates, according to the relation

$$Q_{1,2} = k * \frac{\lambda \max}{\Delta t} = \frac{(v_{REF} - V_{R1,2})\max}{\Delta t}$$

and the exceeding of a predetermined limit value of this quotient is assessed as an indicator of single disturbances, and wherein, upon detection of such a single disturbance, the braking pressure on the wheel where the single disturbance occurred is increased until the wheel deceleration falls short of a predetermined limit value.

6,041,278

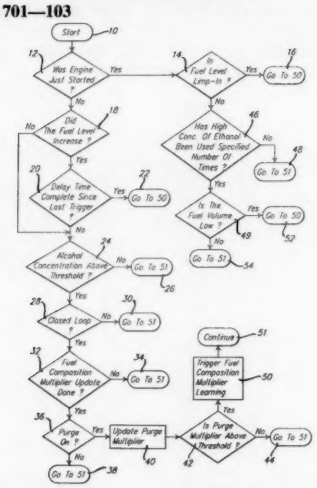
METHOD OF TRIGGERING A DETERMINATION OF THE COMPOSITION OF FUEL IN A FLEXIBLE FUELED VEHICLE

Jerry Kennie, Canton; Yi Cheng, Jackson; Mark E. Hope; Shean Huff, both of Ann Arbor; Robert J. Nankee, II, Canton; Mary Joyce, Farmington Hills; Dennis A. Krozek, Novi; Richard K. Moote, Ann Arbor; Roland T. Richardson, Detroit; William D. Rotramel, Plymouth, and Gary L. Seitz, Chelsea, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Oct. 29, 1997, Appl. No. 958,403

Int. Cl.[7] G01M *15/00*

U.S. Cl. 701—103 **5 Claims**


Start
Was Engine Just Started ?
Is Fuel Level Limp-In ?
Go To 50
Did The Fuel Level Increase ?
Has High Conc. Of Ethanol Been Used Specified Number Of Times ?
Go To 51
Delay Time Complete Since Last Trigger
Is The Fuel Volume Low ?
Alcohol Concentration Above Threshold ?
Closed Loop ?
Fuel Composition Multiplier Update Done ?
Continue
Trigger Fuel Composition Multiplier Learning
Purge On ?
Update Purge Multiplier
Is Purge Multiplier Above Threshold ?
Yes
No

1. A method of triggering a fuel composition learning system in a flexible fueled vehicle comprising:

detecting a group of fuel parameters, said group consisting of additional fuel added to a tank of said vehicle, a fuel level in said tank dropping below a predetermined level, a failure of a fuel level sensor, and an indicia of a composition of said fuel;

testing a detected value of one of said group of fuel parameters against known threshold criteria; and

triggering said fuel composition learning system if said detected value of said one of said group differs from said threshold criteria by a preselected amount.

6,041,279

FUEL METERING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hidetaka Maki; Shusuke Akazaki, and Toshiaki Hirota, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

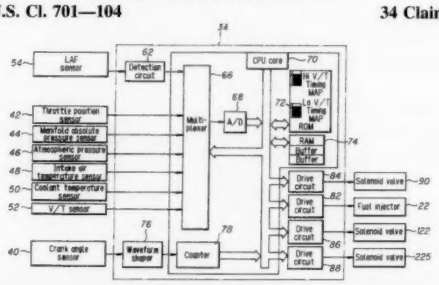
Filed Dec. 29, 1995, Appl. No. 580,592

Claims priority, application Japan, Feb. 25, 1995, 7-061652

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06G *7/70;* **F02M** *23/00*

U.S. Cl. 701—104 **34 Claims**



1. A system for controlling fuel metering for a multi-cylinder internal combustion engine, said engine having an exhaust system, said system comprising:

(a) an air/fuel ratio sensor located in the exhaust system of the engine;

(b) engine operating condition detecting means for detecting engine operating conditions including at least engine speed and engine load;

(c) fuel injection quantity determining means coupled to said operating condition detecting means, for determining a quantity of fuel injection for individual cylinders based on at least the detected engine operating conditions;

(d) fuel injector means coupled to said fuel injection quantity determining means, for injecting fuel in the individual cylinders of the engine based on the determined quantity of fuel injection; and

(e) a feedback loop means having an adaptive controller means and an adaptation mechanism means, coupled to an input of the adaptive controller means for establishing controller means parameters, said adaptive controller means correcting the quantity of fuel injection to bring a controlled variable based on at least an output of said air/fuel ratio sensor to a desired value, wherein:

said feedback loop means includes discriminating means for discriminating, based on the controller means parameters, whether the adaptive controller means operates stably.

6,041,280

GPS CAR NAVIGATION SYSTEM

Sanjai Kohli, Manhattan Beach, and Steven Chen, Cerritos, both of Calif., assignors to SiRF Technology, Inc., Santa Clara, Calif.

Provisional application No. 60/013,514, Mar. 15, 1996. This application Apr. 25, 1996, Appl. No. 637,537.

Int. Cl.[7] G06G *7/78;* **G01S** *5/00*

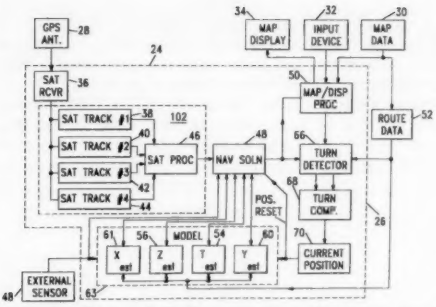
U.S. Cl. 701—201 **5 Claims**

1. A method of updating GPS position information for a vehicle navigating on roadways, comprising the steps of:

estimating the location of a vehicle along a predetermined track from the signals from a single GPS satellite;

deriving an indication that the vehicle has made a turn at a particular point along a predetermined track;

comparing the turn indication with stored navigation data to select data related to one or more predicted turns at or near the particular point;



comparing the turn indication with the predicted turn data to verify that the indicated turn corresponds to the predicted turn; and

updating the estimated position of the vehicle along the track to indicate that the vehicle was at the predicted turn location at a time corresponding to the turn indication.

6,041,281

INFORMATION GUIDANCE SYSTEM BASED ON STRUCTURE CONFIGURATION MAP

Mitsuhiro Nimura; Seiji Hayashi; Yasunobu Ito, and Keizo Inoue, all of Anjo, Japan, assignors to Aisin AW Co., Ltd.

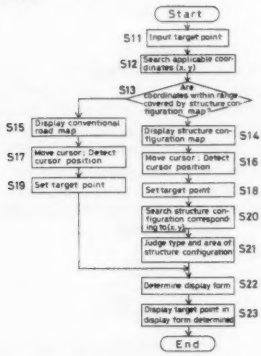
Continuation of application No. 08/739,323, Oct. 29, 1996, Pat. No. 5,890,088. This application Feb. 5, 1999, Appl. No. 244,885.

Claims priority, application Japan, Oct. 31, 1995, 7-284256; Oct. 31, 1995, 7-284257; Oct. 31, 1995, 7-284258

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06G *7/78*

U.S. Cl. 701—211 **7 Claims**



1. A guidance system for providing guidance information based on a structure configuration map, comprising:

storage means for storing data including structure configuration map information including configurational data for structures in the form of rows of coordinates, each row of coordinates representing a structural configuration of an individual structure, said structures including buildings and other facilities, and for storing structure information relating to the structures;

structure configuration map display control means for depicting and displaying a structure configuration map showing structural configurations of the buildings and other facilities based on the structure configuration map information stored in said storage means;

input means for setting a target point;

detecting means for detecting coordinates for the target point set by operation of said input means;

searching means for searching for a structure including the coordinates of the target point detected by said detecting means; and

display form chance means for emphasizing display of the structure, which includes the coordinates of the target point, on the displayed structure configuration map.

6,041,282

SEISMIC CABLE AND METHOD OF MAKING THE SAME

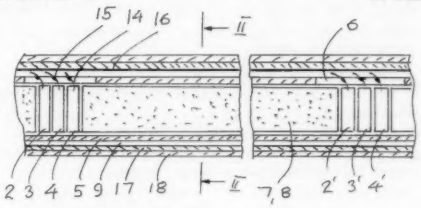
Jørn Wardeberg, Billingstad, and Anton Marius Knudsen, Son, both of Norway, assignors to Alcatel, Paris, France

Filed May 26, 1998, Appl. No. 84,743

Claims priority, application Norway, Jun. 9, 1997, 972635

Int. Cl.[7] G01V *1/16*

U.S. Cl. 702—1 **10 Claims**



1. Seismic cable comprising:

(a) a central tube defined by a tube wall having at least one longitudinal slit therein;

(b) a plurality of seismic sensor devices arranged at intervals within the central tube;

(c) a plurality of elongated electrical/optical elements arranged externally of the central tube; and

(d) interconnections between the sensor devices and the elongated elements are arranged externally of the tube via the at least one longitudinal slit in the tube wall.

6,041,283

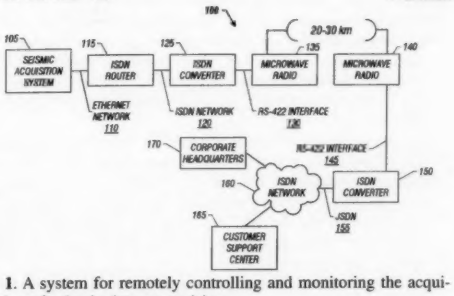
REMOTE CONTROL SYSTEM FOR SEISMIC ACQUISITION

Axel M. Sigmar, Sugar Land; James W. Iseli, Allen; Jozsef Szalay, Austin; Janos Haide, Austin, and Andras A. Feszthammer, Austin, all of Tex., assignors to Input/Output, Inc., Stafford, Tex.

Provisional application No. 60/095,704, Aug. 7, 1998. This application Sep. 11, 1998, Appl. No. 151,260.

Int. Cl.[7] G06F *19/00*

U.S. Cl. 702—16 **9 Claims**



1. A system for remotely controlling and monitoring the acquisition of seismic data, comprising:

a remote seismic data acquisition system adapted to control the acquisition of seismic data;

a network communications interface operably coupled to the seismic data acquisition system;

an integrated services digital network router operably coupled to the network communications interface;

a first integrated services digital network communications interface operably coupled to the integrated services digital network router;

a first integrated services digital network converter operably coupled to the first integrated services digital network communications interface;

a first communications interface operably coupled to the integrated services digital network converter;

a first microwave transceiver operably coupled to the first communications interface;

a second microwave transceiver operably coupled to the first microwave transceiver;

a second communications interface operably coupled to the second microwave transceiver;

a second integrated services digital network converter operably coupled to the second communications interface;

a second integrated services digital network communications interface operably coupled to the second integrated services digital network converter;

an integrated services digital network operably coupled to the second integrated services digital network communications interface; and

a local customer support center operably coupled to the integrated services digital network adapted to control the operation of the seismic data acquisition system.

6,041,284

APPARATUS AND METHOD FOR DETERMINING COORDINATES OF A DESIGNATED POINT

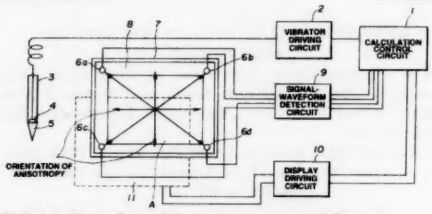
Yuichiro Yoshimura, Kamakura; Atsushi Tanaka, Yamato; Ryozo Yanagisawa, Inzai; Katsuyuki Kobayashi, and Hajime Sato, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1997, Appl. No. 879,603

Claims priority, application Japan, Jun. 25, 1996, 8-164465

Int. Cl.[7] G08C *21/00*

U.S. Cl. 702—56 **22 Claims**



1. A coordinate determining apparatus, comprising:

a vibration transmission plate having anisotropic properties such that vibrations from a vibration generation source applied to said vibration transmission plate propagate through said vibration transmission plate with differing vibration transmission velocities depending on a direction of transmission of vibration;

a plurality of vibration detection means for detecting vibrations transmitted through said vibration transmission plate; and

determination means for determining coordinates of the vibration generation source by measuring time periods of propagation of vibrations through said vibration transmission plate from the vibration generation source to one or more of said vibration detection means,

wherein said vibration transmission plate and said plurality of vibration detection means are provided such that bisectors of angles made by two line segments each connecting two opposing vibration detection means from among the plurality of vibration detection means coincide with orthogonal axes of anisotropy of said vibration transmission plate.

6,041,285

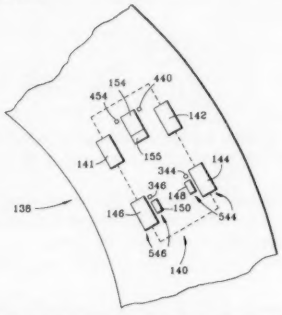
AC MOTORIZED WHEEL CONTROL SYSTEM

Henry Todd Young, North East; Frederick Gaylord Beach, Erie, both of Pa., and James Price Roman, Nashotah, Wis., assignors to General Electric Company, Erie, Pa.

Division of application No. 08/923,484, Sep. 4, 1997, Pat. No. 5,939,846. This application Nov. 13, 1998, Appl. No. 192,080.

Int. Cl.[7] H02P *1/54*

U.S. Cl. 702—113 **11 Claims**



1. A method for determining a maximum amount of available horsepower in a drive system including two AC motorized wheels, the method comprising:

sensing an engine speed;

using the speed to determine a nominal amount of available horsepower;

obtaining an actual engine load status signal;

applying a desired load status signal and the actual engine load status signal to a proportional-integral regulator;

using the nominal amount of available horsepower and an output signal of the proportional-integral regulator to determine the maximum amount of available horsepower.

6,041,286

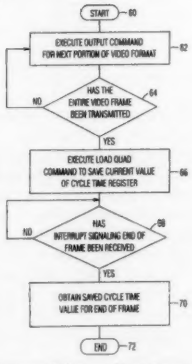
APPARATUS FOR AND METHOD OF ACCURATELY OBTAINING THE CYCLE TIME OF COMPLETION OF TRANSMISSION OF VIDEO FRAMES WITHIN AN ISOCHRONOUS STREAM OF DATA TRANSMITTED OVER AN IEEE 1394 SERIAL BUS NETWORK

Larry L. White, San Jose, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Oct. 21, 1997, Appl. No. 957,965

Int. Cl.[7] G06F *11/34*

U.S. Cl. 702—176 **19 Claims**



17. A method of transmitting a video frame of data comprising the steps of:

a. transmitting the video frame;

b. executing a command to obtain a time value corresponding to completion of transmission of a last portion of the video frame;

c. recording the time value corresponding to completion of transmission of the last portion of the video frame within a command structure of the command;

d. waiting for an interrupt signal confirming completion of transmission of the last portion of the video frame; and

e. obtaining the time value from the command structure when the interrupt signal is received.

6,041,287

SYSTEM ARCHITECTURE FOR ON-LINE MACHINE DIAGNOSTICS

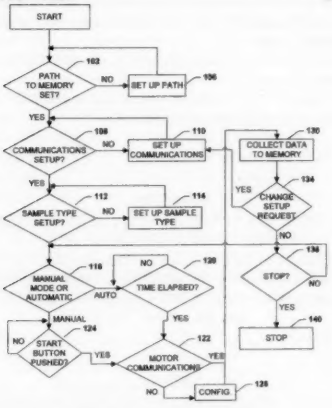
Carl J. Dister, North Olmsted, and Frederick M. Discenzo, Brecksville, both of Ohio, assignors to Reliance Electric Industrial Company, Cleveland, Ohio

Continuation-in-part of application No. 08/745,167, Nov. 7, 1996, Pat. No. 5,917,428, and application No. 08/988,177, Dec. 10, 1997. This application May 6, 1998, Appl. No. 73,505.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G01F *1/56*

U.S. Cl. 702—182 **36 Claims**



1. A machine diagnostic system, including:

a host computer for determining a health state of a machine, the host computer being operatively coupled to a network backbone;

a machine diagnostic module adapted to be integrally mounted to a machine, the machine diagnostic module being operatively coupled to the network backbone, the machine diagnostic module collecting data relating to operation of the machine;

a system architecture including a software based analysis layer, the analysis layer providing for preprocessing of the machine data, the analysis layer being operative to facilitate determining positive sequence and negative sequence relating to the machine;

wherein the host computer analyzes the preprocessed data in making a determination as to the health state of the machine.

6,041,288

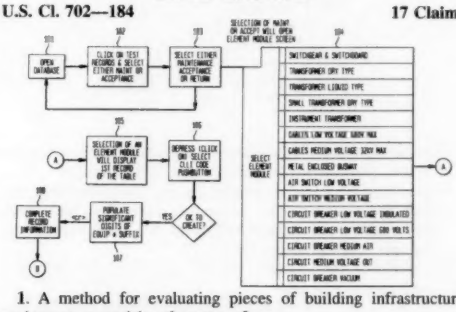
METHOD AND APPARATUS FOR EVALUATING POWER EQUIPMENT

Ralph A. Ruffolo, Somerdale, N.J., and John A. Sinerchio, Fresno, Calif., assignors to AT&T Corp., New York, N.Y.

Filed Jan. 20, 1998, Appl. No. 9,081

Int. Cl.[7] G07B *17/02*

U.S. Cl. 702—184 **17 Claims**


OPEN DATABASE
CLICK ON TEST RECORDS & SELECT EITHER MAINT OR ACCEPTANCE
SELECT EITHER MAINTENANCE ACCEPTANCE OR RETURN
SELECTION OF MAINT OR ACCEPT WILL OPEN ELEMENT MODULE SCREEN
SELECTION OF AN ELEMENT MODULE WILL DISPLAY 1ST RECORD OF THE TABLE
DEPRESS CLICK ON SELECT CLU1 CODE PUSHBUTTON
SELECT ELEMENT MODULE
COMPLETE RECORD INFORMATION
<CR>
POPULATE SIGNIFICANT DIGITS OF EQUIP + SUFFIX
YES
OK TO CREATE?
SWITCHGEAR & SWITCHBOARD
TRANSFORMER DRY TYPE
TRANSFORMER LIQUID TYPE
SMALL TRANSFORMER DRY TYPE
INSTRUMENT TRANSFORMER
CABLES LOW VOLTAGE 600V MAX
CABLES MEDIUM VOLTAGE 35KV MAX
METAL ENCLOSED BUSWAY
AIR SWITCH LOW VOLTAGE
AIR SWITCH MEDIUM VOLTAGE
CIRCUIT BREAKER LOW VOLTAGE INSULATED
CIRCUIT BREAKER LOW VOLTAGE 600 VOLTS
CIRCUIT BREAKER MEDIUM AIR
CIRCUIT MEDIUM VOLTAGE OIL
CIRCUIT BREAKER VACUUM

1. A method for evaluating pieces of building infrastructure equipment, comprising the steps of:

(a) storing, in a data base, for each piece of equipment, a record containing an associated identification, and an operating tolerance specification, designating an acceptable range of operating parameters;

(b) selecting said each piece of said infrastructure equipment for evaluation by retrieving from said data base said identification and corresponding operating tolerance specification for said each piece of equipment;

(c) evaluating said selected piece of equipment by conducting a test of current operating parameters to determine if said selected equipment piece has each of its operating parameters within the specified acceptable range, and if not, then

(i.) assessing what impact said selected piece of equipment has on the distribution network when said selected piece of equipment has at least one operating parameter outside the specified acceptable range;

(ii.) taking corrective action on said selected piece of equipment in accordance with the impact; otherwise,

(d) selecting another of said pieces of equipment; and

(e) repeating steps (a)–(d) until said equipment pieces have been selected.

6,041,289

METHOD AND DEVICE FOR A DATA MANAGEMENT SYSTEM WHICH IS CAPABLE OF CALIBRATION

Peter Schimitzek, Geilenkirchen, Germany, assignor to CSB-System Software-Entwicklung & Unternehmensberatung GmbH, Geilenkirchen, Germany

PCT No. PCT/DE95/01235, § 371 Date Mar. 21, 1997, § 102(e) Date Mar. 21, 1997, PCT Pub. No. WO96/09523, PCT Pub. Date Mar. 28, 1996

PCT Filed Sep. 7, 1995, Appl. No. 817,036

Claims priority, application Germany, Sep. 23, 1994, 44 33 913; Sep. 23, 1994, 94 15 398 U; Mar. 17, 1995, 195 09 775

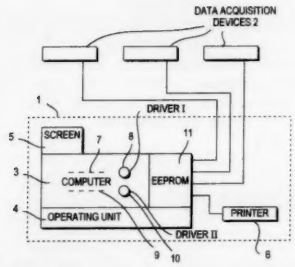
Int. Cl.[7] F25B *49/02*

U.S. Cl. 702—187 **12 Claims**

1. A method of acquiring, calibrating and storing measured weight data in a secure manner and of acquiring and storing other non-calibratable measured data for display and processing, said method comprising the steps of:

a) providing a plurality of calibratable weight data acquisition devices (**2**) and at least one non-calibratable data acquisition device (**2**) for non-calibratable data other than weight;

b) providing an approved calibrating device (**1**) in non-interacting dialogue with each of said data acquisition devices (**2**), wherein said approved calibrating device (**1**) comprises a computer (**3**) including a first driver (**1,8**), a second driver (**11,10**), a monitor (**5**), a memory and an EEPROM card (**11**);



c) triggering the data acquisition devices (**2**) to obtain measured weight data and non-calibratable data besides weight;

d) providing the measured weight data and non-calibratable data with references by means of the first driver (**I**,**8**), the second driver (**II**,**10**) and the EEPROM card (**11**) during transfer by the approved calibrating device (**1**);

e) calibrating the measured weight data to obtain calibrated measured weight data;

f) buffer-storing the calibrated measured weight data and the non-calibrated data in a manipulation-proof and non-erasable form on said EEPROM card (**11**); and

g) transferring the buffered calibrated weight data from the EEPROM card (**11**) to said memory of the computer (**3**);

whereby said buffered calibrated weight data is available for retrieval at any time in any order and current measured weight data and current non-calibratable data from said data acquisition devices (**2**) are retrievable in any order by said computer for display on said monitor (**5**).

6,041,290

METHOD OF ADAPTIVELY ADJUSTING THE COEFFICIENTS OF A DIGITAL FILTER IN AN ECHO CANCELLER

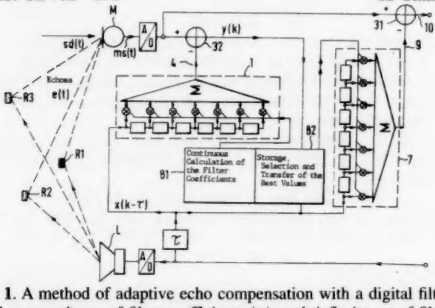
Hans Jürgen Matt, Remseck; Michael Walker, Baltmannsweiler, and Uwe Ackermann, Freiberg, all of Germany, assignors to Alcatel, Paris, France

Filed Nov. 13, 1997, Appl. No. 969,735

Claims priority, application Germany, Nov. 15, 1996, 196 47 276

Int. Cl.[7] **H04B** *3/20*

U.S. Cl. 702—191 **12 Claims**



1. A method of adaptive echo compensation with a digital filter whose number n of filter coefficients (c_j), or briefly its set of filter coefficients (C(j)), is calculated in accordance with the Normalized-Least-Mean-Square algorithm, in a transmission system in which a coupling occurs between a signal path in the receiving direction and a signal path in the transmitting direction, characterized in that

the set of filter coefficients (C(j)) is compared to an envelope curve (H(j)),

an error measurement (F(j)) is calculated from the variation between the values of the set of filter coefficients (C(j)) and those provided by the envelope curve (H(j)),

only the set of filter coefficients (C(j)) in which the error measurement (F(j)) drops below a threshold value is used further to adjust the digital filter.

6,041,291

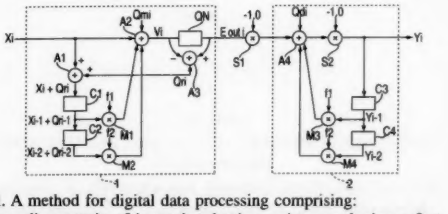
DIGITAL DATA PROCESSING CIRCUIT AND DIGITAL DATA PROCESSING METHOD

Motohiro Yamazaki, Kawasaki; Shuichi Ando, Matsudo, and Akira Toyama, Chigasaki, all of Japan, assignors to Nippon Precision Circuits, Inc., Tokyo, Japan

Filed Jul. 17, 1998, Appl. No. 118,249

Int. Cl.[7] **G06F** *17/10*

U.S. Cl. 702—191 **14 Claims**



1. A method for digital data processing comprising:

encoding a train of input data having a sign, employing a first filtering operation, quantization processing and addition of a quantization noise, said first filtering operation associated with first truncation noise, said first truncation noise caused by the multiplication by one or more filter coefficients;

inverting said sign of output data following encoding;

decoding said output data subjected to said encoding, employing a second filtering operation, said second filtering operation associated with second truncation noise, said second truncation noise caused by the multiplication by one or more filter coefficients; and

correcting the inverted sign of the data to said original sign of the data;

whereby said first and second truncation noises caused by the respective filtering operations are offset.

6,041,292

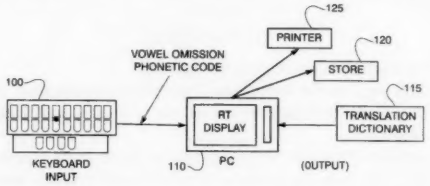
REAL TIME STENOGRAPHIC SYSTEM UTILIZING VOWEL OMISSION PRINCIPLE

Carol Jochim, 3234 E. Corrine Dr., Phoenix, Ariz. 85032

Provisional application No. 60/010,063, Jan. 16, 1996. This application Jan. 15, 1997, Appl. No. 783,271.

Int. Cl.[7] **G06F** *17/28*

U.S. Cl. 704—3 **15 Claims**



SCHEMATIC OF STENO SYSTEM

1. A real time, spelling-independent stenographic system comprising:

(a) input means having a keyboard for generating electronic data representing the shorthand strokes;

(b) storage means for storing the electronic data;

(c) a translation dictionary of the steno strokes and the corresponding English text in which "uh" vowel sounds and unemphasized "eh" and "ih" vowel sounds preceding final side consonants are omitted from medial and ending strokes; and

(d) means for comparing the electronic data and the translation dictionary and converting the steno strokes to English text.

6,041,293

DOCUMENT PROCESSING METHOD AND APPARATUS THEREFOR FOR TRANSLATING KEYWORDS ACCORDING TO A MEANING OF EXTRACTED WORDS

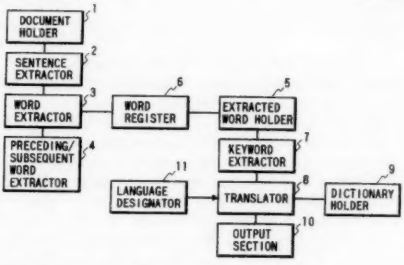
Shogo Shibata, Kawasaki; Minoru Fujita; Yuji Ikeda, both of Yokohama; Takaya Ueda, Kawasaki; Fumiaki Itoh, and Makoto Hirota, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1996, Appl. No. 657,042

Claims priority, application Japan, May 31, 1995, 7-134226

Int. Cl.[7] G06F *17/28*

U.S. Cl. 704—4 **18 Claims**



1. A document processing apparatus comprising:

first word extracting means for extracting a first word from document data;

preceding/subsequent word extracting means for extracting, from the document data, a second word that is one of a preceding word and a subsequent word of the first word;

keyword extracting means for extracting a keyword of the document data, based on a frequency of occurrence of the first word, wherein said keyword extracting means includes word counting means for counting a number of occurrences of each word, other than unnecessary words which are pre-excluded from being keywords, in the document data, said keyword extracting means extracting a word having a high number of occurrences, counted by said word counting means, as the keyword; and

translation means for translating the keyword into a predetermined language by referring to a dictionary in a process that considers a meaning of the first and second words existing together in the document data.

6,041,294

SIGNAL QUALITY DETERMINING DEVICE AND METHOD

John Gerard Beerends, The Hague, Netherlands, assignor to Koninklijke PTT Nederland N.V., Netherlands

PCT No. PCT/EP96/01143, § 371 Date Sep. 5, 1997, § 102(e) Date Sep. 5, 1997, PCT Pub. No. WO96/28950, PCT Pub. Date Sep. 19, 1996

PCT Filed Mar. 13, 1996, Appl. No. 913,039

Claims priority, application Netherlands, Mar. 15, 1995, 9500512

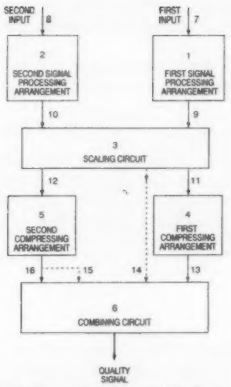
Int. Cl.[7] G01L *21/02;* **H04B** *15/00*

U.S. Cl. 704—203 **20 Claims**

12. A method for determining quality of an output signal generated by a signal processing circuit with respect to a reference signal, the method comprising the steps of:

generating a first signal parameter as a function of time and frequency in response to the output signal;

compressing the first signal parameter so as to yield a first compressed signal parameter;



generating a second compressed signal parameter in response to the reference signal;

determining a difference signal in response to the first and second compressed signal parameters;

reducing an amplitude of the difference signal by a predefined amount by either, in response to a sign of the difference signal, adding the predefined amount to the difference signal or subtracting the predefined amount therefrom, so as to yield a reduced difference signal; and

generating a quality signal by integrating the reduced difference signal with respect to time and frequency.

6,041,295

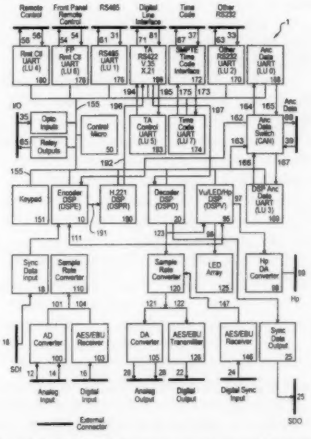
COMPARING CODEC INPUT/OUTPUT TO ADJUST PSYCHO-ACOUSTIC PARAMETERS

Larry W. Hinderks, Holmdel, N.J., assignor to Corporate Computer Systems, Holmdel, N.J.

Continuation of application No. 08/420,721, Apr. 10, 1995, and a continuation of application No. 08/419,200, Apr. 10, 1995. This application Apr. 10, 1996, Appl. No. 630,790.

Int. Cl.[7] G10L *19/00*

U.S. Cl. 704—206 **44 Claims**



1. An adjustable CODEC for compression and decompression of signals including:

an input for receiving an audio signal;

a parameter input unit cooperatively connected to an encoder for inputting and adjusting at least one parameter level of a plurality of pscho-acoustic parameter levels, said encoder containing a compression unit for compressing said signal

based on said parameter levels of said plurality of psycho-acoustic parameters to form a first compressed digital bit stream;

a decoder containing a decompression unit for decompressing a received compressed digital data bit stream to a decompressed signal;

an output connected to the decoder for outputting said decompressed signal; and

a comparing device for comparing the responses of said audio signal and said decompressed digital bit stream;

whereby the comparison provided by the comparing device may be the basis for adjusting said parameter level of said plurality of psycho-acoustic parameter levels.

6,041,296

METHOD OF DERIVING CHARACTERISTICS VALUES FROM A SPEECH SIGNAL

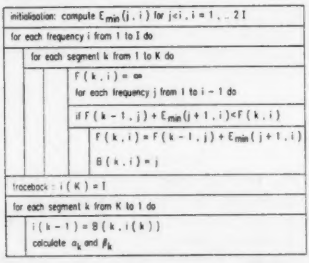
Lutz Welling, and Hermann Ney, both of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1997, Appl. No. 843,808

Claims priority, application Germany, Apr. 23, 1996, 196 16 103

Int. Cl.[7] **G10L** *1/00*

U.S. Cl. 704—209 **3 Claims**


initialization: compute $E_{min}(j,i)$ for $j<i$, $i = 1, \ldots 2I$
for each frequency i from 1 to I do
for each segment k from 1 to K do
$F(k,i) = \infty$
for each frequency j from 1 to i − 1 do
if $F(k-1,j) + E_{min}(j+1,i) < F(k,i)$
$F(k,i) = F(k-1,j) + E_{min}(j+1,i)$
$B(k,i) = j$
traceback : $i(K) = I$
for each segment k from K to 1 do
$i(k-1) = B(k, i(k))$
calculate a_k and β_k

1. A method of deriving characteristic values from a speech signal, comprising the steps of:

a) dividing a speech signal into periods of time;

b) forming a power density spectrum via discrete frequencies of the periods of time of the speech signal;

c) forming the first three autocorrelation coefficients for a predetermined first number K of consecutive segments of the power density spectrum;

d) forming an error value from autocorrelation coefficients for each segment and summing the error values of all segments;

e) repeating the formation of the autocorrelation coefficients and the error values for different boundarys between the segments and determining the optimum boundary frequencies at which the sum of the error values has a minimum;

f) deriving at least a characteristic value for each segment from the autocorrelation coefficients of the segments of the optimum boundary frequencies; and

g) processing the at least one characteristic value for each segment for speech recognition.

6,041,297

VOCODER FOR CODING SPEECH BY USING A CORRELATION BETWEEN SPECTRAL MAGNITUDES AND CANDIDATE EXCITATIONS

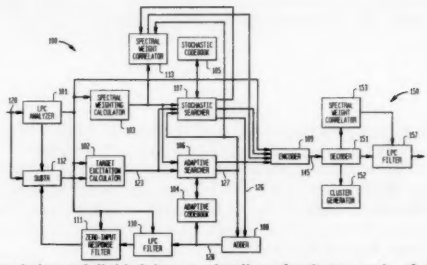
Randy G. Goldberg, Princeton, N.J., assignor to AT&T Corp, New York, N.Y.

Filed Mar. 10, 1997, Appl. No. 814,130

Int. Cl.[7] **G10L** *3/02;9/00*

U.S. Cl. 704—219 **20 Claims**

1. A method of encoding an input frame of speech based on a plurality of candidate excitations, the plurality of candidate excitations being subdivided into a plurality of subsets, each of the subsets including a predetermined amount of the plurality of candidate excitations, the method comprising the steps of:



a) determining a plurality of spectral weights based on the input frame of speech;

b) determining a target excitation based on the input frame of speech;

c) selecting from the plurality of candidate excitations the candidate excitation most closely matching the target excitation;

d) identifying the selected candidate excitation by a variable length index code having a data length based on the predetermined amount of candidate excitations included in the subset corresponding to the selected candidate excitation;

e) communicating a speech characterization code without communicating the selected candidate excitation, the speech characterization code including at least the variable length index code and the plurality of the spectral weights calculated in step a);

f) receiving the speech characterization code communicated in step e); and

g) determining, based on the plurality of spectral weights included in the speech characterization code, the subset of candidate excitations which includes the selected candidate excitation.

6,041,298

METHOD FOR SYNTHESIZING A FRAME OF A SPEECH SIGNAL WITH A COMPUTED STOCHASTIC EXCITATION PART

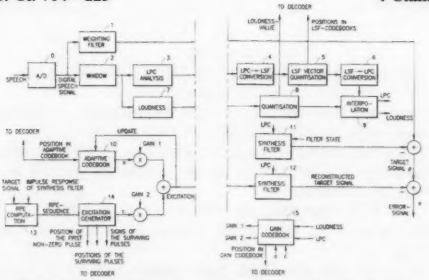
Udo Gortz, Bochum, Germany, assignor to Nokia Mobile Phones, Ltd., Espoo, Finland

Filed Oct. 8, 1997, Appl. No. 947,419

Claims priority, application Germany, Oct. 9, 1996, 196 41 619

Int. Cl.[7] **G10L** *9/04*

U.S. Cl. 704—223 **4 Claims**



1. Method for synthesizing a frame of a speech signal in a speech codec, in which a synthesis filter of a speech coder of the speech codec is supplied with an excitation vector consisting of an adaptive excitation part and a stochastic excitation part, which is taken from a previously calculated ideal Regular Pulse Excitation (RPE) sequence, comprising steps of:

a) determining a position of a first non-zero pulse in the ideal RPE sequence,

b) determining positions of a preselected number of strongest pulses in the ideal RPE sequence,

c) determining amplitudes of the preselected number of strongest pulses, and

d) determining signs of the preselected number of strongest pulses,

wherein the positions, amplitudes, and signs furthermore being transmitted to a speech decoder of the speech codec in order to produce the stochastic excitation part there as well.

6,041,299

APPARATUS FOR CALCULATING A POSTERIOR PROBABILITY OF PHONEME SYMBOL, AND SPEECH RECOGNITION APPARATUS

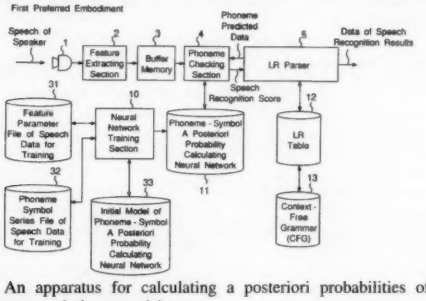
Mike Schuster, Kyoto, and Toshiaki Fukada, Nara, both of Japan, assignors to ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan

Filed Mar. 11, 1998, Appl. No. 38,128

Claims priority, application Japan, Mar. 11, 1997, 9-056138

Int. Cl.[7] G10L *5/06*

U.S. Cl. 704—232 **16 Claims**


First Preferred Embodiment
Speech of Speaker
Feature Extracting Section
Buffer Memory
Phoneme Checking Section
Phoneme Predicted Data
LR Parser
Data of Speech Recognition Results
Speech Recognition Score
Feature Parameter File of Speech Data for Training
Neural Network Training Section
Phoneme - Symbol A Posteriori Probability Calculating Neural Network
LR Table
Phoneme Symbol Series File of Speech Data for Training
Initial Model of Phoneme - Symbol A Posteriori Probability Calculating Neural Network
Context - Free Grammar (CFG)

1. An apparatus for calculating a posteriori probabilities of phoneme symbols, comprising:

feature extracting means for extracting speech feature parameters from a speech signal of an uttered speech sentence composed of an inputted character series; and

calculating means for calculating a a posteriori probability of a phoneme symbol of the speech signal, by using a bidirectional recurrent neural network,

wherein said bidirectional recurrent neural network comprises:

an input layer for receiving, as input signals, the speech feature parameters extracted by the feature extracting means and a plurality of hypothetical phoneme symbol series signals;

an intermediate layer of at least one layer having a plurality of units; and

an output layer for outputting a a posteriori probability of each phoneme symbol,

wherein said input layer comprises:

a first input neuron group having a plurality of units, for receiving, as input signals, a plurality of speech feature parameters and a plurality of phoneme symbol series signals;

a forward module; and

a backward module,

wherein said forward module has a forward-in-time feedback connection, and generates and outputs to said intermediate layer, a plurality of parameters of a timing delayed by a predetermined unit time from a plurality of parameters outputted from said first input neuron group, based on a plurality of speech feature parameters and a plurality of phoneme symbol series signals, and wherein said backward module has a backward-in-time feedback connection, and generates and outputs to said intermediate layer, a plurality of parameters of a timing inversely delayed by a predetermined unit timing from a plurality of parameters outputted from said first input neuron group, based on a plurality of speech feature parameters.

6,041,300

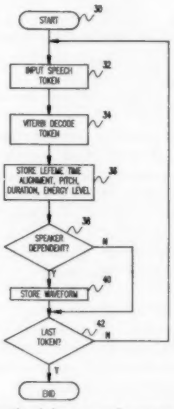
SYSTEM AND METHOD OF USING PRE-ENROLLED SPEECH SUB-UNITS FOR EFFICIENT SPEECH SYNTHESIS

Abraham Poovakunnel Ittycheriah, and Stephane Herman Maes, both of Danbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1997, Appl. No. 821,520

Int. Cl.[7] G10L *5/04*

U.S. Cl. 704—255 **14 Claims**



4. A method for synthesizing speech comprising the steps of:

inputting by a speaker a plurality of speech tokens comprising an enrolled vocabulary;

decoding each of said plurality of speech tokens into a plurality of lefemes associated with each of said plurality of speech tokens in said enrolled vocabulary, said lefemes comprising portions of phones in a given context;

storing instances of said plurality of lefemes as representative waveforms;

inputting a token to be recognized;

decoding said token to be recognized into a plurality of lefemes;

matching said lefemes of said token to be recognized to ones of said stored plurality of lefemes; and

concatenating ones of said stored plurality of representative waveforms to synthesize a recognized token in the speaker's voice.

6,041,301

CONFIGURING AN AUDIO INTERFACE WITH CONTINGENT MICROPHONE SETUP

Frank Fado, Highland Beach; Peter Guasti, Coral Springs; Amado Nassiff, Boynton Beach, and Ronald VanBuskirk, Indiantown, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

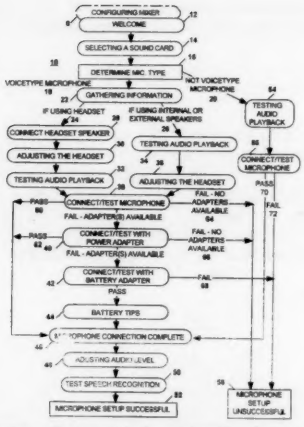
Filed Oct. 29, 1997, Appl. No. 960,311

Int. Cl.[7] G01L *3/00*

U.S. Cl. 704—270 **5 Claims**

1. A method for configuring an audio interface for a speech recognition application in a computer system, comprising the steps of:

(a) determining from a data storage registry of said speech recognition application whether a microphone operatively associated with said computer system has been previously successfully set up for operation with said speech recognition application;



(b) displaying a first graphical user interface having a first user activatable icon for automatically guiding a user through a programmed procedure for setting up said microphone and a second user activatable icon for automatically adjusting an audio recording level for said microphone;

(c) in the event said microphone is not registered as having been previously successfully set up, altering said second icon in appearance and disregarding attempted activation of said second icon; and,

(d) in the event said microphone is registered as having been previously successfully set up, respectively initiating said procedure for setting up of said microphone and said adjusting of said audio recording level responsive to activation of said first or second icons respectively.

6,041,302
DATA COMPRESSION/EXPANSION USING A RICE ENCODER/DECODER

Alphons A. M. L. Bruekers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

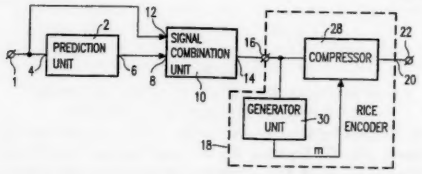
PCT No. PCT/IB97/01415, § 371 Date Jun. 22, 1998, § 102(e) Date Jun. 22, 1998, PCT Pub. No. WO98/21830, PCT Pub. Date May 22, 1998

PCT Filed Nov. 10, 1997, Appl. No. 91,727

Claims priority, application European Pat. Off., Nov. 11, 1996, 96203108

Int. Cl.[7] **G10L** *9/18*

U.S. Cl. 704—503 **15 Claims**



1. A data compression apparatus for data compressing a digital information signal obtained from a digital audio signal, the digital information signal comprising p-bit samples, where p is an integer larger than 1, the apparatus comprising:

means for receiving the digital information signal,

lossless compression means for carrying out a substantially lossless compression step on the digital information signal so as to obtain a data compressed digital information signal, the lossless compression means comprising a Huffman type encoder,

output means for supplying the data compressed digital information signal, characterized in - that the Huffman type encoder is a Rice encoder, which Rice encoder is distinguishable by a code parameter m, the Rice encoder comprising generator means for generating said code parameter from N samples of the digital information signal in accordance with the following formula:

$$A \cdot \log_2 m = \left\{ \left(\frac{B}{N} \right) \cdot \sum_{n=1}^{N} |x[n]| \right\}$$

where A and B are constants and x[n] is the n-th sample of the N samples, where N is an integer larger than 0.

6,041,303
METHOD OF ASSISTING THE CONDUCTING OF A RESEARCH PROJECT

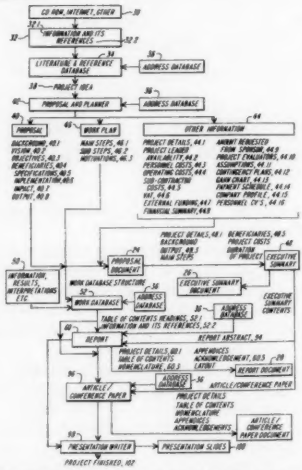
Edward Henry Mathews, 29 Nicklaus Street, Silver Lakes, Pretoria, South Africa

Filed Jun. 6, 1997, Appl. No. 870,481

Claims priority, application South Africa, Jun. 7, 1996, 96/4864

Int. Cl.[7] **G06F** *17/30;17/21*

U.S. Cl. 705—1 **22 Claims**



18. A software package for use in assisting the conducting of a research project which comprises a plurality of steps, the software comprising:

a reference database module arranged to generate predetermined first prompts to guide the researcher to enter reference data corresponding to said first prompts, and to store the entered reference data in a first database having a structure which is at least partially predetermined;

a work database module arranged to generate predetermined second prompts to guide the researcher to enter proposal data corresponding to said second prompts, to automatically retrieve selected reference data from the first database and to store the selected reference data and the proposal data in a second database for re-use; and

an interface module arranged to extract selected data from the second database and to generate a first report comprising the selected data and the proposal data, so that the first report has a format which is at least partially determined by the structure of the second database.

6,041,304

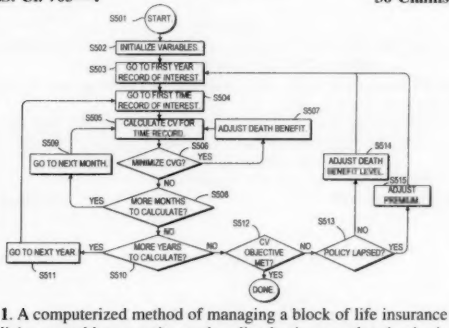
SYSTEM AND METHOD FOR CONTROLLING THE CASH VALUE GROWTH OF AN INSURANCE POLICY

Bennett S. Meyer, Elkins Park; William D. Chatfield, Downington, both of Pa.; Larry R. Sluder, Plano, and James W. Radosevich, Carrollton, both of Tex., assignors to Meyer-Chatfield, Inc., Jenkintown, Pa.

Filed Feb. 26, 1997, Appl. No. 806,780

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—4 **30 Claims**



1. A computerized method of managing a block of life insurance policies owned by an entity, each policy having a cash value basis and a plurality of terms associated therewith to control the change in cash value of the life insurance policy in relation to the basis of the life insurance policy, comprising:

accessing selected data having terms associated therewith, wherein said data is representative of the insurance policies;

calculating a first value from said data of the insurance policies for a predetermined point in time;

comparing said first value to a predetermined value at said predetermined point in time;

applying an adjustment to said comparison in accordance with a predetermined criteria; and

modifying at least one of said terms in accordance with said adjustment so that the cash value of the life insurance policies in relation to the basis of the life insurance policies is managed, and returning a managed flow of money to said entity as death benefits.

6,041,305

METHOD AND APPARATUS OF CONTROLLING RESERVATION FOR GOODS AND THE LIKE

Yasuo Sakurai, Osaka, Japan, assignor to Daishin Frame Inc., Osaka, Japan

Filed Apr. 24, 1997, Appl. No. 840,068

Claims priority, application Japan, Apr. 25, 1996, 8-105445; Nov. 20, 1996, 8-309670

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—5 **22 Claims**

1. A method of managing reservations of various items of commerce, the various items of commerce including at least one of goods and services, in which the reservations are placed by individuals from a reserving party side for acceptance from a providing party side by at least one provider of said various items of commerce, the method comprising the steps of:

setting and registering individual identification means pertinent to individual data of an unspecified number of individuals of the general public;

receiving reservation data for particular ones of the various items of commerce communicated by a particular one of said individuals for whom the individual identification means have already been set and registered;

setting a reservation code to the reservation data representative of each of the particular ones of the various items of commerce reserved and notifying said particular one of said individuals that said reservation code has been set;

receiving modifying information data input from one of said reserving party side and said performing party side indicating a desired revision of the reservation data to which the reservation code has been set, the desired revision including one of change and cancellation,

sending a notification indicating receipt of the modifying information data from one of the reserving party side and the performing party side prior to performing the desired revision of the reservation data, said notification being sent to a remaining one of the reserving party side and the performing party side affected by said desired revision;

performing the desired revision of reservation data after confirmation of said modifying information data, and on condition of receipt of modifying information acknowledgement data inputted from said remaining one of the reserving party side and the performing party side; and

sending revised reservation data to notify said remaining one of said reserving party side and said performing party side to enable mutual performance by said reserving party side and said performing party side of the items of commerce represented by the revised reservation data.

6,041,306

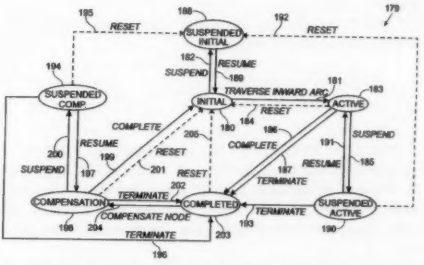
SYSTEM AND METHOD FOR PERFORMING FLEXIBLE WORKFLOW PROCESS EXECUTION IN A DISTRIBUTED WORKFLOW MANAGEMENT SYSTEM

Weimin Du, San Jose; James W. Davis; Clemens Pfeifer, both of Sunnyvale; Ming-Chien Shan, Saratoga, and Nicolas Sheard, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Provisional application No. 60/032,567, Dec. 5, 1996. This application Mar. 21, 1997, Appl. No. 821,940.

Int. Cl.[7] G06F *9/40*

U.S. Cl. 705—8 **7 Claims**



1. A system for performing flexible workflow process in a distributed workflow management system that includes multiple computers, comprising:

a workflow process management system operating on at least one of the computers to control execution of the workflow process which includes process instances;

a plurality of resources coupled to respective ones of the computers to carry out the process instances;

a plurality of state machines that comprise

a process instance state machine that includes a plurality of states including (1) a compensation state that allows a failed process instance at a work node to be compensated such that resumption of execution of the failed process instance can be from a specified end compensation point, and (2) a suspended compensation state that allows the process instance in the compensation state to move to the suspended compensation state when the process instance becomes suspended;

a work node instance state machine for a work node instance manager that manages work nodes of the workflow process, wherein the work node instance state machine includes a plurality of states including the compensation state and the suspended compensation state; and

a rule node instance state machine for a rule node instance manager that manages rule nodes of the workflow process.

6,041,307

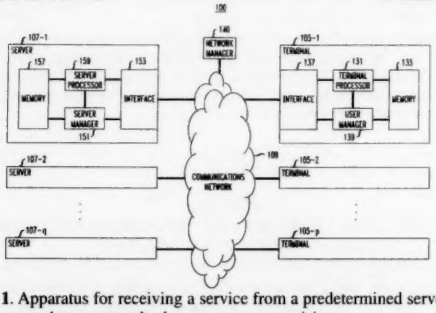
TECHNIQUE FOR EFFECTIVELY MANAGING RESOURCES IN A NETWORK

Sudhir R. Ahuja, Aberdeen, N.J.; Ioannis A. Korilis, New York, N.Y., and Theodora A. Varvarigou, Athens, Greece, assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 23, 1998, Appl. No. 12,866

Int. Cl.[7] B43K *29/00*

U.S. Cl. 705—8 **40 Claims**



1. Apparatus for receiving a service from a predetermined server connected to a network, the apparatus comprising:

a processor for issuing a request for the service to the predetermined server through the network;

an interface for receiving, from the network, information on a price to be paid for the service, the price varying with at least availability of at least one resource in the predetermined server, said price being received in response to an issued request; and

a controller for electing to receive the service based on a determination involving the price.

6,041,308

SYSTEM AND METHOD FOR MOTIVATING SUBMISSION OF CONDITIONAL PURCHASE OFFERS

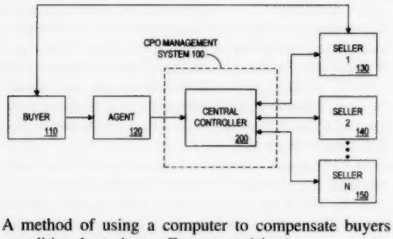
Jay S. Walker, Ridgefield; T. Scott Case, Darien; Tracy Hartmann, Stamford, and Daniel E. Tedesco, New Canaan, all of Conn., assignors to priceline.com Incorporated, Stamford, Conn.

Continuation-in-part of application No. 08/943,483, Oct. 3, 1997, which is a continuation-in-part of application No. 08/923,683, Sep. 4, 1997, which is a continuation-in-part of application No. 08/889,319, Jul. 8, 1997, which is a continuation-in-part of application No. 08/707,660, Sep. 4, 1996, Pat. No. 5,794,207. This application Dec. 4, 1998, Appl. No. 205,787.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *19/00*

U.S. Cl. 705—14 **71 Claims**



1. A method of using a computer to compensate buyers who make conditional purchase offers, comprising:

receiving, using a computer, a conditional purchase offer from a buyer for a product, said conditional purchase offer containing at least one buyer-defined condition and a variable condition;

processing said conditional purchase offer to determine if said conditional purchase offer is accepted by a seller; and

compensating said buyer if said conditional purchase offer is not accepted by a seller.

6,041,309

METHOD OF AND SYSTEM FOR DISTRIBUTING AND REDEEMING ELECTRONIC COUPONS

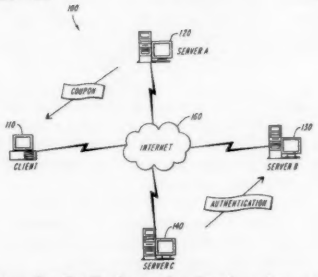
Raviv Laor, New York, N.Y., assignor to OneClip.com, Incorporated, Atlanta, Ga.

Continuation-in-part of application No. 09/160,748, Sep. 25, 1998. This application Dec. 23, 1998, Appl. No. 220,414.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—14 **28 Claims**



1. A system for distributing and redeeming electronic coupons comprising:

a first server system including a computer processor and associated memory, said first server system being connected by a communications channel to a client system, said first server system being adapted for transmitting an electronic coupon to said client system over said communications channel, without regard to predetermined client criteria;

said client system including a computer processor and associated memory, said client system being adapted for storing said electronic coupon in said memory; and,

a second server system connected to said communications channel, said second server system being adapted to establish a connection with said client system and for detecting said electronic coupon stored on said client system, said second server system further being adapted to redeem said electronic coupon.

6,041,310

METHOD AND SYSTEM FOR AUTOMOBILE TRANSACTIONS

H. Dean Green, Greensboro; George J. Salquero, High Point, and Lowell Lang, deceased, late of Greensboro, all of N.C., by Marilyn Lang, legal representative, assignors to Green Ford, Inc.

Filed Dec. 12, 1996, Appl. No. 764,541

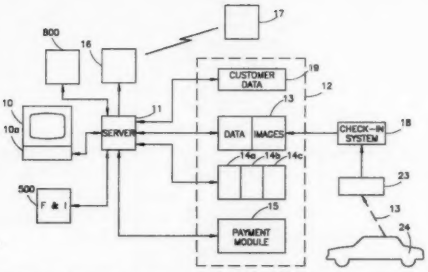
Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—27 **32 Claims**

1. An on-site system for facilitating an automobile transaction for a customer comprising:

a) an input/display terminal adapted to form a multilevel customer query and to display responses thereto, the terminal including a terminal processor, wherein the terminal processor is adapted to create a link between the customer and a salesperson assigned to that customer;

b) a data server adapted to route a customer query from the input/display terminal to a storage device containing customer data, automobile inventory data, vehicle images, and video



files, wherein the storage device is adapted to communicate to the input/display device via the data server a selected inventory responsive to the customer query;

c) a communications device for making a customer-initiated contact with the linked sales person from the input/display terminal via the data server.

6,041,311

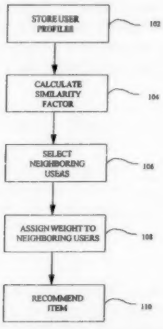
METHOD AND APPARATUS FOR ITEM RECOMMENDATION USING AUTOMATED COLLABORATIVE FILTERING

Alexander Chislenko; Yezdezard Z. Lashkari, both of Cambridge, and John E. McNulty, Burlington, all of Mass., assignors to Microsoft Corporation, Redmond, Wash.

Continuation-in-part of application No. 08/597,442, Feb. 2, 1996, abandoned, Provisional application No. 60/000,598, Jun. 30, 1995, Provisional application No. 60/008,458, Dec. 11, 1995. This application Jan. 28, 1997, Appl. No. 789,758.

Int. Cl.[7] G06F *17/30*

U.S. Cl. 705—27 **33 Claims**



1. A method for operating a machine to recommend an item to one of a plurality of users, the item not yet rated by the user, the method comprising the steps of:

(a) storing, using the machine, a user profile in a memory for each of the plurality of users, wherein at least one of the user profiles includes a plurality of values, one of the plurality of values representing a rating given to one of a plurality of items by the user and another of the plurality of values representing additional information;

(b) calculating, using the machine, for the user, a plurality of similarity factors responsive to both ratings given to items by the user and the additional information, each of the plurality of similarity factors representing a similarity between the user and another one of the plurality of users;

(c) selecting, using the machine, for the user, a plurality of neighboring users based on the similarity factors, the selecting step comprising the steps of, for each of the plurality of users:

(c1) comparing associated similarity factors for the user and each one of the plurality of users; and

(c2) choosing said each one of the plurality of users as one of the neighboring users if a difference between the associated similarity factors exceeds a predetermined threshold value;

(d) assigning, using the machine, a weight to each of the neighboring users; and

(e) recommending, using the machine, at least one of the plurality of items to the user based on the weights assigned to the plurality of neighboring users and ratings given to the plurality of items by the plurality of neighboring users.

6,041,312

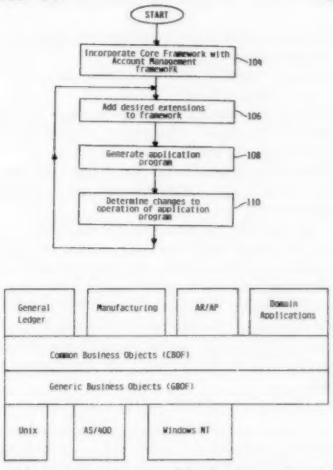
OBJECT ORIENTED TECHNOLOGY FRAMEWORK FOR ACCOUNTS RECEIVABLE AND ACCOUNTS PAYABLE

Matthew John Bickerton, Stratford, United Kingdom; Kathryn Ann Bohrer, Austin, Tex.; Emma Suzanne Hughes, Dudley, United Kingdom; Edward William Kenworthy, Stratford upon Avon, United Kingdom; Rupert Jeremy Musgrove, Alcester, United Kingdom; LindaMay Rose Patterson, Rochester, Minn.; Steven Porter, Shaw, United Kingdom; David Dennis Salt, Prestbury, United Kingdom, and Duncan Keith Scattergood, Boughton Hackett, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1997, Appl. No. 834,647

Int. Cl.[7] G06F *17/30;15/18*

U.S. Cl. 705—30 **35 Claims**



8. An object oriented extensible business financial ledger account management framework for use in a computer system having an operating system that supports an object oriented programming environment and includes a memory in which cooperating objects comprising object classes can be stored, the object oriented framework comprising a set of object oriented classes including at least one user-extensible class that a user of the framework can extend using object oriented principles of inheritance to define a business financial account management application, the framework comprising a Ledger Account Application category of cooperating objects that contain business financial accounts data and perform accounts receivables and accounts payable operations on the business financial accounts data, wherein the Ledger Account Application category of cooperating objects comprises an Account object class that specifies an account structure for containing accounts receivables, accounts payable, company identification, and business partner identification data to specify the business financial accounts data, the framework further comprising a Debt Management Items category of cooperating objects that reference transactions between a company and a business

partner and a Log Entry category of cooperating objects that identifies the transaction prior to a commit operation on the transaction.

6,041,313

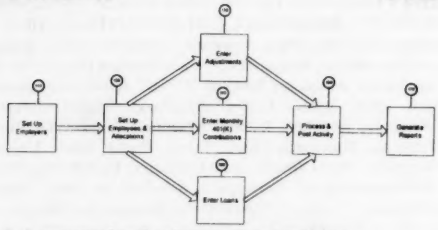
401K USER SOFTWARE

James A. Gilbert, 10600 Wilshire Blvd., #729, Los Angeles, Calif. 90024, and Manish Gupta, Beverly Hills, Calif., assignors to James A. Gilbert, Los Angeles, Calif.

Filed Jun. 29, 1998, Appl. No. 106,009

Int. Cl.[7] G06F *17/00*

U.S. Cl. 705—36 **31 Claims**



1. A computer-based retirement plan comprising:

a menu-based data input interface;

a plurality of main menu selections including any of: mutual fund information, management reports or employer information;

said mutual fund information including at least group and portfolio administration;

said management reports including at least one of: client list or commission administration;

said employer information including at least one of: report compilations, employee information, mutual fund choices, vesting schedules or monthly processing;

said employer information further comprising individual account number allocation per employee for each separate mutual fund choice, and

wherein said individual account number allocation enables one or more of: adding individual mutual fund choices separate from other employee choices, producing monthly reports for each individual without direct interaction with other employee accounts; producing direct access to mutual fund balances for an individual employee based only on the individual account number, or adding new mutual fund choices for individual employees without modification of other employee fund choices.

6,041,314

MULTIPLE ACCOUNT PORTABLE WIRELESS FINANCIAL MESSAGING UNIT

Walter Lee Davis, 5820 NW. 96 Dr., Parkland, Fla. 33076

Filed Dec. 22, 1997, Appl. No. 995,796

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—41 **34 Claims**

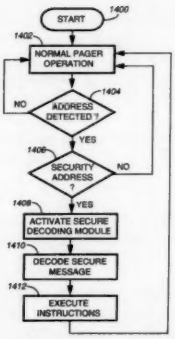
1. A portable secure financial messaging unit, comprising:

a receiver for receiving a radio frequency signal comprising a secure financial transaction message;

a selective call decoder coupled to the receiver, the selective call decoder comprising:

a memory that includes a plurality of unique selective call addresses each corresponding with a predetermined financial transaction type; and

an address correlator coupled to the memory, the address correlator operating to determine substantial coincidence between at least one of the plurality of unique selective call addresses and a received selective call address contained in the radio frequency signal and corresponding with the predetermined financial transaction type;



a financial transaction processor coupled to the selective call decoder, the financial transaction processor allowing the portable secure financial messaging unit to effect a secure financial transaction based at least in part on information contained in the secure financial transaction message; and

a main processor coupled to the financial transaction processor and the selective call decoder for controlling the receiver, selective call decoder, and financial transaction processor such that the portable secure financial messaging unit operates to perform the secure financial transaction.

6,041,315

AUTOMATED PAYMENT SYSTEM AND METHOD

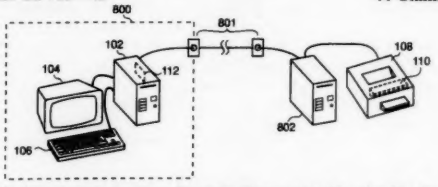
Robert E. Pollin, Germantown, Md., assignor to Autoscribe Corporation, Rockville, Md.

Division of application No. 08/625,295, Apr. 1, 1996, Pat. No. 5,727,249, which is a division of application No. 07/959,930, Oct. 15, 1992, Pat. No. 5,504,677. This application Jun. 19, 1997, Appl. No. 879,022.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *17/60*

U.S. Cl. 705—45 **44 Claims**



1. An automated system for generating a plurality of authorized drafts on financial accounts belonging to a plurality of payers, in payment of debts to a payee, comprising:

input means for performing an electronic information input process wherein a system operator contemporaneously enters information sufficient to identify a new payer previously unknown to the system and information specifying a draft to be generated on an account of that payer, said information including a financial institution identification number and an amount to be drafted from said payer's account;

an institutional database comprising financial institution identification information:

institution verification means associated with said input means for receiving said financial institution identification number and comparing said financial institution identification number to entries in said institutional database, wherein when said financial institution is found in the institutional database, the institution verification means retrieves identifying information about the institution and verifies the accuracy of said financial institution identification number, and wherein when said financial institution is not found in the institutional database, an error indication is generated; and

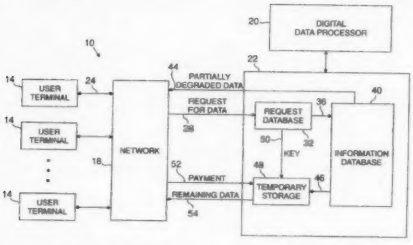
output means connected to said input means for receiving said information specifying a draft and generating a paper copy of said draft.

6,041,316

METHOD AND SYSTEM FOR ENSURING ROYALTY PAYMENTS FOR DATA DELIVERED OVER A NETWORK

Jonathon Brandon Allen, Mountainside, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 25, 1994, Appl. No. 280,039
Int. Cl.[7] H04L *9/32*
U.S. Cl. 705—52 **27 Claims**



3. A method of delivering data over a communication network, comprising the steps of:

generating a partially-degraded version of the data by altering a portion of the data to reduce its perceived quality when utilized;

providing the partially-degraded version of the data over the network to a customer at a user terminal connected to the network; and

providing a higher quality version of the data to the customer over the network if the customer is entitled to receive the higher quality version, said method further including the steps of:

receiving a request for the data from the customer at the user terminal;

retrieving the requested data from an information database;

partially degrading the data to produce the partially-degraded version;

transmitting the partially-degraded version to the customer over the communication network; and

determining whether the customer is entitled to receive the higher quality version of the data.

6,041,317

POSTAL SECURITY DEVICE INCORPORATING PERIODIC AND AUTOMATIC SELF IMPLEMENTATION OF PUBLIC/PRIVATE KEY PAIR

George Brookner, Norwalk, Conn., assignor to Ascom Hasler Mailing Systems, Inc., Shelton, Conn.

Provisional application No. 60/031,305, Nov. 19, 1996. This application Nov. 19, 1997, Appl. No. 974,028.
Int. Cl.[7] G06F *17/00*
U.S. Cl. 705—61 **14 Claims**

1. A postal security device comprising:

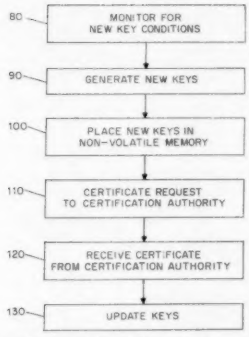
(a) means for determining if a new key pair should be generated in response to a predetermined criterion;

(b) means for generating a new key pair;

(c) non-volatile memory for storing said new key pair;

(d) means for requesting a certificate of authentication for a portion of said new key pair from a Certification Authority;

(e) means for receiving a certificate of authentication for said portion of said new key pair from said Certification Authority;



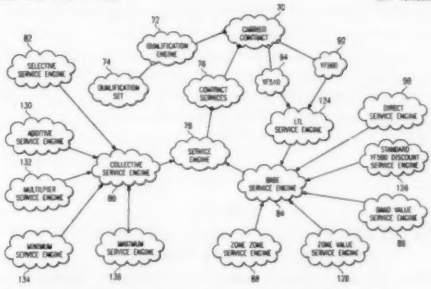
(f) means for updating said postal security device such that said new key pair will be henceforth used by said postal security device.

6,041,318

OBJECT ORIENTED RATING SYSTEM AND METHOD

Henrik Danford-Klein, Green Bay, and John Kring, Suamico, both of Wis., assignors to Schneider National, Inc., Green Bay, Wis.

Filed Aug. 4, 1997, Appl. No. 905,676
Int. Cl.[7] G06F *17/60*
U.S. Cl. 705—400 **29 Claims**



1. An object-oriented rating system, comprising:

at least one carrier contract object comprising an instance of a carrier contract class, the carrier contract object operable to receive a rating request and operable for use on a computer;

a qualification engine associated with the carrier contract object, the qualification engine operable to receive qualification data associated with the rating request and determine whether the carrier contract object is applicable to the rating request; and

a service engine operable to calculate a service rate in response to the rating request, the service engine comprising an instance of an object class that inherits, either directly or indirectly, from a base service engine object class.

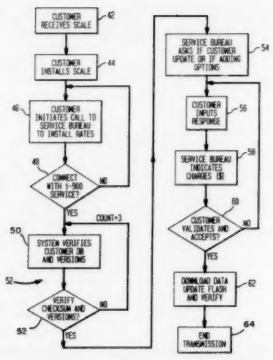
6,041,319

METHOD AND SYSTEM FOR TELEPHONE UPDATES OF POSTAL SCALES

Edward R. Bass, Trumbull; Konstantin G. Kodonas, Norwalk, and Vincent R. Weis, Sandy Hook, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 14, 1997, Appl. No. 892,116
Int. Cl.[7] G07B *17/00*
U.S. Cl. 705—409 **12 Claims**

1. In a system including a postal apparatus at a customer site for providing an output representative of a postal value pursuant to



postal regulations, and a service bureau at a remote location, the improvement comprising:

a method for providing updated postal information for storage in the postal apparatus upon change of the postal regulations, comprising the steps of:

(a) establishing a bi-directional connection between the postal apparatus and the service bureau via a communication medium;

(b) downloading the updated postal information to the postal apparatus via the bi-directional connection; and

(c) billing the customer site by using the bi-directional connection to provide billing information for the updated postal information provided thereto.

6,041,320

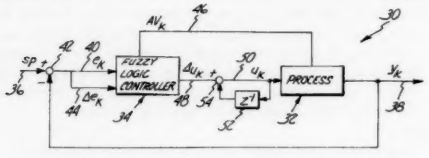
MULTI-REGION FUZZY LOGIC CONTROL SYSTEM WITH AUXILIARY VARIABLES

Si-Zhao Joe Qin, Austin, and Guy Thompson Borders, San Antonio, both of Tex., assignors to Fisher Controls International, Inc., Austin, Tex.

Filed Aug. 23, 1993, Appl. No. 110,506

Int. Cl.[7] G06F *15/18*

U.S. Cl. 706—1 **33 Claims**



1. A control system for controlling a non-linear process as a function of a process error signal, the non-linear process having a plurality of regions of operation, the control system comprising:

means for producing an auxiliary variable signals which is indicative of an instantaneous region of operation for the non-linear process, the instantaneous region of operation being one of the plurality of regions of operation; and

a fuzzy logic controller for producing a process control output signal for controlling the non-linear process in the instantaneous region of operation as a function of the process error signal and the auxiliary variable signal.

6,041,321

ELECTRONIC DEVICE FOR PERFORMING CONVOLUTION OPERATIONS

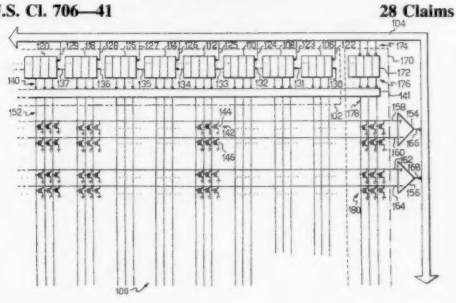
Vito Fabbrizio, Piacenza, Italy, and Alan Kramer, Berkeley, Calif., assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Oct. 10, 1997, Appl. No. 953,956

Claims priority, application European Pat. Off., Oct. 15, 1996, 96830525

Int. Cl.[7] G06F *15/18*

U.S. Cl. 706—41 **28 Claims**



1. An electronic device for performing a convolution operation between an original matrix and a mask matrix, comprising:

a plurality of shift registers each comprising a plurality of cells for receiving binary input values representative of the original matrix;

a matrix of synapses having a plurality of columns and at least one line for storing weights correlated with the mask matrix, the synapses of each column being connected to a corresponding cell to receive the binary value contained in the cell as an input and to output a weighted value dependent upon the product of the binary value and the weight stored, each synapse having a substantially zero conductance for a first binary value and a conductance correlated with the weight stored for a second binary value;

at least one neuron connected to the synapses of a corresponding line to receive a sum of the weighted values of the synapses of the corresponding line as an input and to output a binary result dependent upon the sum, each neuron comprising conductance-measurement means for generating the binary result in dependence on a total conductance of the synapses of the corresponding line;

wherein each synapse comprises a positive synapse and a negative synapse formed as memory cells which can store a positive weight and a negative weight, respectively; and wherein said conductance-measurement means generates the binary result in dependence on a comparison between a total conductance of the positive synapses and a total conductance of the negative synapses of the corresponding line; and

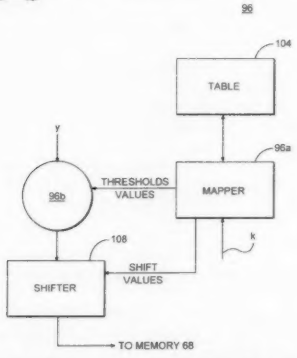
wherein each memory cell has a first terminal, a second terminal and a control terminal; wherein the first terminal of each memory cell is connected to a reference terminal; wherein the control terminals of the memory cells of each column are connected to the corresponding cells of the shift registers; wherein the second terminals of the memory cells providing the positive synapses and the negative synapses of each line are connected to a first input line and to a second input line to the corresponding neuron, respectively; and wherein the total conductance of the positive synapses and of the negative synapses of the line are substantially equal to the conductance of the first line and of the second line, respectively.

6,041,322

METHOD AND APPARATUS FOR PROCESSING DATA IN A NEURAL NETWORK

Wan-Yu Meng; Cheng-Kai Chang, both of Taipei; Hwai-Tsu Chang, Hsinchu; Fang-Ru Hsu, Hsinchu, and Ming-Rong Lee, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Apr. 18, 1997, Appl. No. 839,818
Int. Cl.[7] G06E *1/00;3/00*
U.S. Cl. 706—43 **7 Claims**



1. An apparatus for processing data in a neural network having a stored sample transfer function, comprising:

a receiver configured to receive at least one input value representing information to be processed by the network;

a threshold processor configured to determine threshold values indicating boundaries for application of the sample transfer function for a node, the threshold processor comprising:

a mapper configured to receive a value representing a specific transfer function for the node and map the received value to identify threshold values for the specific transfer function;

a generator configured to generate an intermediate value from the input value for the node; and

an output processor configured to determine an output value for the node based on the threshold values and the intermediate value in accordance with the sample transfer function.

6,041,323

INFORMATION SEARCH METHOD, INFORMATION SEARCH DEVICE, AND STORAGE MEDIUM FOR STORING AN INFORMATION SEARCH PROGRAM

Rie Kubota, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1997, Appl. No. 837,346
Claims priority, application Japan, Apr. 17, 1996, 8-095691
Int. Cl.[7] G06F *17/30*
U.S. Cl. 707—5 **19 Claims**

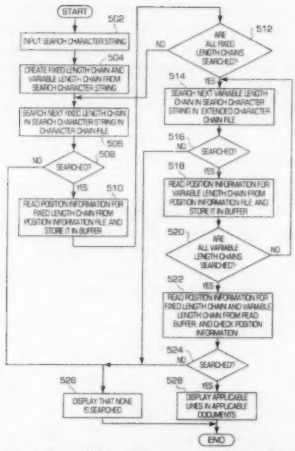
1. A method for identifying at least one unique character string in an input document which is input into a computer system, said computer system being operable to search one or more documents which are searchably stored in a storage medium, and said unique character string is used as a search string, the method comprising:

associating and managing position information for a position in said searchably stored documents where one or more partial comparison document character strings are extracted from said searchably stored documents;

extracting a partial input character string from said input document, and determining whether said partial input character string is a candidate character string;

identifying a partial comparison document character string which matches at least a part of said candidate character string with a predetermined similarity factor or higher;

identifying position data associated with said partial comparison document character string which matches with said predetermined similarity factor or higher; and


START
502
INPUT SEARCH CHARACTER STRING
504
CREATE FIXED LENGTH CHAIN AND VARIABLE LENGTH CHAIN FROM SEARCH CHARACTER STRING
SEARCH NEXT FIXED LENGTH CHAIN IN SEARCH CHARACTER STRING IN CHARACTER CHAIN FILE
506
SEARCHED?
NO
YES
508
510
READ POSITION INFORMATION FOR FIXED LENGTH CHAIN FROM POSITION INFORMATION FILE AND STORE IT IN BUFFER
ARE ALL FIXED LENGTH CHAINS SEARCHED?
512
514
SEARCH NEXT VARIABLE LENGTH CHAIN IN SEARCH CHARACTER STRING IN EXTENDED CHARACTER CHAIN FILE
516
518
READ POSITION INFORMATION FOR VARIABLE LENGTH CHAIN FROM POSITION INFORMATION FILE AND STORE IT IN BUFFER
520
ARE ALL VARIABLE LENGTH CHAINS SEARCHED?
522
READ POSITION INFORMATION FOR FIXED LENGTH CHAIN AND VARIABLE LENGTH CHAIN FROM READ BUFFER AND CHECK POSITION INFORMATION
524
526
DISPLAY THAT NONE IS SEARCHED
528
DISPLAY APPLICABLE LINES IN APPLICABLE DOCUMENTS
END

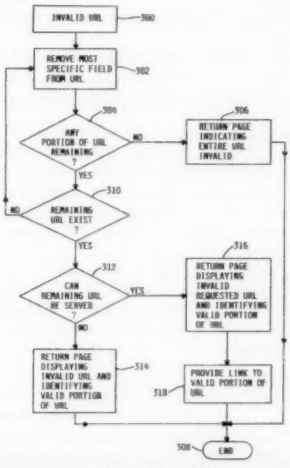
recognizing said candidate character string as the unique character string by comparing appearance frequency information of at least a part of said candidate character string appearing in said input document with the position data and evaluating an amount of feature of said candidate character string.

6,041,324

SYSTEM AND METHOD FOR IDENTIFYING VALID PORTION OF COMPUTER RESOURCE IDENTIFIER

Joel Ray Earl, Rochester; David John Goodman, Byron, and George Wayne Nation, Eyota, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1997, Appl. No. 972,106
Int. Cl.[7] G06F *17/30*
U.S. Cl. 707—9 **40 Claims**



31. A computing system for determining a valid portion of a desired Uniform Resource Locator (URL) used to access a targeted network resource, wherein the desired URL has been determined to be invalid, the computing system comprising:

(a) a client computer comprising:

(i) a user interface to allow a user to enter the desired URL; and

(ii) a display device to display the desired URL;

(b) a network server comprising:

(i) a memory configured to store a plurality of available URLs; and

(ii) a processor configured to identify the desired URL as an invalid URL, and to remove predefined portions of the invalid URL until a resulting modified URL is identified as a valid URL included within at least one of the available URLs.

6,041,325

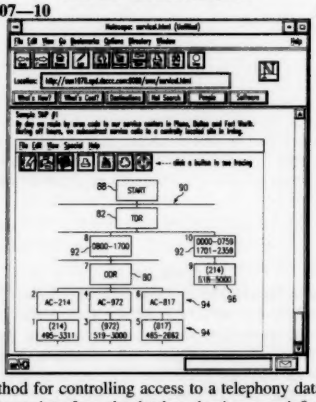
SYSTEM AND METHOD FOR CONTROLLING ACCESS TO A TELEPHONY DATABASE

Tasvir Shah, Irving; Mark A. Harrison, Fort Worth, and Matthew Bilbo, Bedford, all of Tex., assignors to Alcatel USA Sourcing, L.P., Plano, Tex.

Filed Oct. 9, 1997, Appl. No. 948,161

Int. Cl.[7] G06F *17/30;3/14*

U.S. Cl. 707—10 **33 Claims**



1. A method for controlling access to a telephony database with a graphical user interface, the database having a predefined schema for storing telephony data in the telephony database, the method comprising the steps of:

a) providing a logic analyzer, a schema query, a screen builder, and a screen interpreter;

b) generating executable code with the logic analyzer, the code for supporting interaction between the screen interpreter and the telephony database according to the schema query and the predefined schema;

c) using the schema query to direct the screen builder to assemble a screen for supporting the graphical user interface;

d) inserting the executable code into the screen assembled by the screen builder to create a service screen definition; and

e) providing the service screen definition to the screen interpreter to enable a graphical user interface for interacting with the telephony database;

f) providing direct access for a subscriber to the telephony database through the graphical user interface, the subscriber operable to enable or modify services represented in the telephony database without service operator or service provider assistance.

6,041,326

METHOD AND SYSTEM IN A COMPUTER NETWORK FOR AN INTELLIGENT SEARCH ENGINE

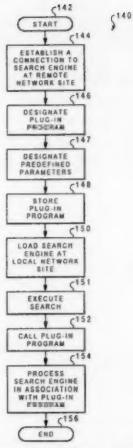
Hatim Yousef Amro, Austin, and John Paul Dodson, Pflugerville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1997, Appl. No. 971,018

Int. Cl.[7] G06F *17/00*

U.S. Cl. 707—10 **12 Claims**

1. A method for enhanced on-line search processing in a distributed computer network which includes at least one on-line search



engine at a network site remote from a local network site, said method comprising the steps of:

designating an independent user-defined plug-in program to be stored at said local network site for limiting the scope of on-line data searches;

transmitting at least one search parameter from said local network site to said at least one on-line search engine at said network site remote from said local network site to initiate a search by said on-line search engine throughout said distributed computer network for data related to said at least one search parameter; and

automatically linking said independent user-defined plug-in program with said at least one search parameter such that a result of said search initiated throughout said distributed computer network will be filtered utilizing both said at least one search parameter and said independent user-defined plug-in program.

6,041,327

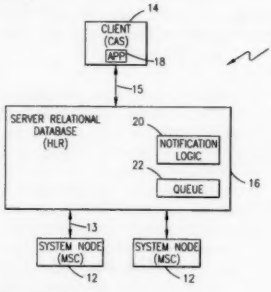
IMPLEMENTATION OF NOTIFICATION CAPABILITIES IN RELATIONAL DATABASES

Roch Glitho, Montreal, and Mario Banville, Pointe Claire, both of Canada, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 12, 1997, Appl. No. 989,944

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—10 **18 Claims**



1. A system, comprising:

a client; and

a server relational database including logic operating to monitor for accesses to the server relational database indicative of events of interest and generate notifications concerning those events of interest for communication to the client, said logic functioning to:

receive a first message from the client including an identification of events of interest to the client;

determine whether monitored accesses to the server relational database are indicative of the identified events of interest to the client;

receive a second message from the client requesting that the client be notified of any determined events of interest; and

send a notification to the client containing an identification of those determined events of interest.

6,041,328

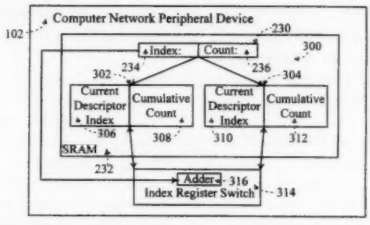
TRACKING AVAILABILITY OF ELEMENTS WITHIN A SHARED LIST OF ELEMENTS FROM AN INDEX AND COUNT MECHANISM

Ching Yu, Santa Clara, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 17, 1997, Appl. No. 992,619

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—10 **12 Claims**



9. A method for keeping track of elements, within a list of elements, that are available for processing by a given device from a plurality of entries of an index and count, the index indicating a starting element in the list that is available to the given device for processing and the count indicating a subsequent number of elements, from the starting element in the list, that are available to the given device for processing, the method including the steps of:

keeping track of a last element down the list that is available to the given device for processing and a current element in the list that is currently being processed by the given device, at a first register index, the current element through the last element in the list being available to the given device for processing;

keeping track of the last element and the current element, at a second index register;

controlling the given device to switch from using the first index register to using the second index register for keeping track of the last available element when the given device has been using the first index register for keeping track of the last available element and when the last available element wraps back over a beginning element in the list;

controlling the given device to switch from using the second index register to using the first index register for keeping track of the last available element when the given device has been using the second index register for keeping track of the last available element and when the last available element wraps back over the beginning element in the list;

controlling the given device to switch from using the first index register to using the second index register for keeping track of the current element that is currently being processed when the given device has been using the first index register for keeping track of the current element and when the current element kept track of by the first index register is a very last element in the list; and

controlling the given device to switch from using the second index register to using the first index register for keeping track of the current element that is currently being processed when the given device has been using the second index register for keeping track of the current element and when the current element kept track of by the second index register is the very last element in the list.

6,041,329

AUTOMATED MESSAGE PROCESSING SYSTEM CONFIGURED TO AUTOMATICALLY MANAGE INTRODUCTION OF REMOVABLE DATA STORAGE MEDIA INTO MEDIA LIBRARY

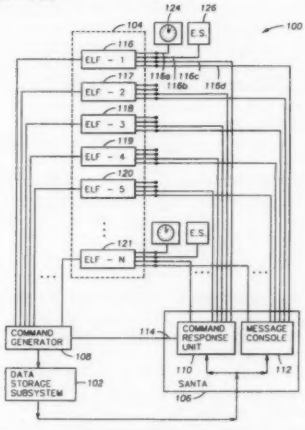
Gregory Tad Kishi, Oro Valley, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1997, Appl. No. 865,277

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—100 **51 Claims**



1. A method of receiving units of removable data storage media into a data storage subsystem comprising:

a library including:

multiple data storage media units;

multiple storage drives to removably receive and access the data storage media units;

a library manager coupled to the storage controller and the storage drives;

an input facility to receive media units into the library; and

a storage controller coupled to the library;

a machine-readable media directory accessible by at least one of the storage controller and the library manager, the media directory including information associating one or more of the media units with predetermined first and second categories;

an automated storage administrator coupled to the library manager and the storage controller;

said method comprising:

the automated storage administrator repeatedly sending requests to the data storage subsystem to enter a first media unit into the media directory under different categories;

the automated storage administrator ceasing the repeated sending or requests when a first one of the following occurs: requests have been sent to the subsystem under a predetermined number of categories, or the first media unit is successfully entered in the media directory;

if requests have been sent to the subsystem under a predetermined number of categories without successfully entering the first media unit into the media directory, the automated storage administrator sending a request to the catalog to obtain information stored therein representing the first media unit;

the subsystem sending the requested information, and in response, the automated storage administrator sending a request to the media directory to enter data including at least some of the requested information representative of the first media unit.

6,041,330

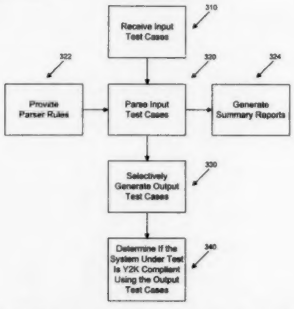
SYSTEM AND METHOD FOR GENERATING YEAR 2000 TEST CASES

David Carman, Highland Park; Siddhartha R. Dalal, Bridgewater; Ashish Jain, Morristown, and Nachimuthu Karunanithi, Wayne, all of N.J., assignors to Telecordia Technologies, Inc., Morristown, N.J.

Provisional application No. 60/053,645, Jul. 24, 1997. This application Jul. 20, 1998, Appl. No. 119,499.

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—101 **39 Claims**



1. A method of generating test cases for use in testing a system for Year 2000 compliance, comprising the steps of:

providing to a data processor one or more input test cases corresponding to the system;

identifying, according to a first set of predetermined criteria, one or more date dependent fields in each of the input test cases, using the data processor; and

selectively generating according to a second set of predetermined criteria one or more output test cases, using the data processor, wherein at least one of the date dependent fields in each of said output test cases includes a risky date from a set of risky dates.

6,041,331

AUTOMATIC EXTRACTION AND GRAPHIC VISUALIZATION SYSTEM AND METHOD

Michael L. Weiner, Webster, N.Y.; John Jacob Kolb V, Rowley, Mass., and Todd Chronis, Rochester, N.Y., assignors to Manning and Napier Information Services, LLC, Rochester, N.Y.

Provisional application No. 60/042,295, Apr. 1, 1997. This application Dec. 12, 1997, Appl. No. 989,832.

Int. Cl.[7] G06F *11/00*

U.S. Cl. 707—103 **11 Claims**

1. A method for analyzing and displaying thematic content of information contained in a plurality of documets in a computing system, said method comprising:

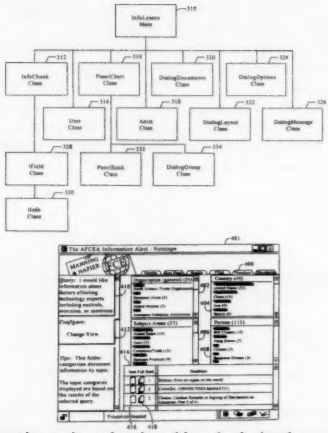
extracting one or more information units from a plurality of documents according to two or more instances of subject fields, including a first subject field and a second subject field, each information unit having a relationship to one or more of said subject fields;

displaying a plurality of panels, including a first panel and a second panel, each of said panels corresponding to each of said subject fields wherein said first panel comprises a visual representation of information units having a relationship with said fistr subject field and said second panel comprises a visual representation of information units having a relationship to said second subject field;

receiving an input, said input indicating a selection from one or more individual instances of filters;

applying individual instances of filters to the information units responsive to said input to produce a filtered set of information units; and

re-displaying said plurality of panels, wherein each of said plurality of panels comprises revised visual representations of



information units, wherein said revised visual representation exclusively includes only those information units in said filtered set of information units.

6,041,332

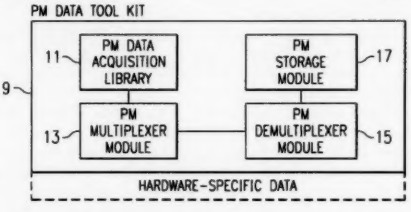
PRODUCT-INDEPENDENT PERFORMANCE MONITORING TOOL KIT

Daniel L. Miller, Dallas; Scott J. Haney, Allen, and Christopher J. Ouellette, McKinney, all of Tex., assignors to Alcatel USA Sourcing, L.P., Plano, Tex.

Filed Dec. 31, 1997, Appl. No. 1,321

Int. Cl.[7] G06F *17/30*

U.S. Cl. 707—104 **8 Claims**



1. A method for configuring software to monitor, generate, acquire, collect, store and analyze Performance Monitoring (PM) data from telecommunication equipment, comprising:

maintaining a library of product-independent PM data processing modules;

maintaining product-dependent data relating selected ones of the processing modules with each of a plurality of telecommunication equipment systems; and

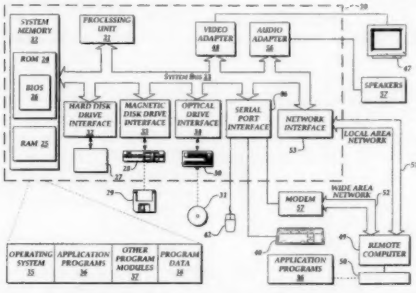
generating PM software corresponding to one or more of the telecommunication equipment systems by assembling the processing modules in accordance with the product-dependent data, wherein the library-maintaining step comprises maintaining a PM multiplexer module for packaging the PM data into a single byte stream for collection.

6,041,333

METHOD AND APPARATUS FOR AUTOMATICALLY UPDATING A DATA FILE FROM A NETWORK

Richard Bretschneider, San Jose; Burton Siu, Redwood Shores, and Imran Iqbal Qureshi, Sunnyvale, all of Calif., assignors to Microsoft Corporation, Redmond, Wash.

Filed Nov. 14, 1997, Appl. No. 970,216
Int. Cl.[7] G06F *17/30*
U.S. Cl. 707—203 **16 Claims**



1. A computer based method for updating a previously installed version of a local program file associated with an application program, comprising:

(a) receiving a command to launch the application program;

(b) in response to receiving the command to launch the application program, determining whether an update to a current version for the previously installed version of the local program file is advisable;

(c) when an affirmative selection of the current version of the program file is provided, retrieving the current version of the program file and automatically employing the current version of the program file to launch the application program; else

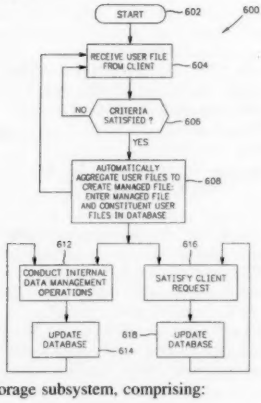
(d) automatically employing the previously installed version of the local program file to launch the application program.

6,041,334

STORAGE MANAGEMENT SYSTEM WITH FILE AGGREGATION SUPPORTING MULTIPLE AGGREGATED FILE COUNTERPARTS

David Maxwell Cannon, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of application No. 08/960,627, Oct. 29, 1997, Pat. No. 5,983,239. This application Apr. 13, 1999, Appl. No. 291,263.
Int. Cl.[7] G06F *17/30*
U.S. Cl. 707—204 **6 Claims**



5. A data storage subsystem, comprising:

a storage including a source storage area and a target storage area, said storage containing one or more managed files each originally created with a contiguous aggregation of constituent user files;

a database, including a mapping table cross-referencing each managed file with its constituent user files and a corresponding location of each user file within the managed file;

a digital data processing apparatus coupled to the storage and the database;

wherein the digital data processing apparatus is programmed to perform a method for processing requests to access data in the storage, the method comprising:

receiving a request to backup a first managed file stored in the storage subsystem to a target storage area;

utilizing the mapping table to identify a user file occupying a predetermined position in the first managed file;

utilizing the mapping table to identify all managed files containing the identified user file;

if one or more managed files are identified in the target storage area, aborting the backup of the first managed file; and

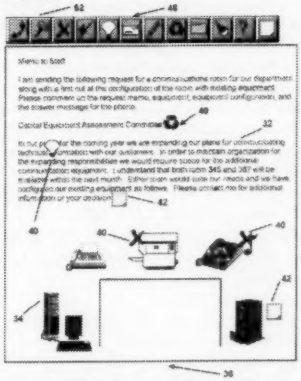
if no managed files are identified in the target storage area, copying the first managed file to the target storage area.

6,041,335

METHOD OF ANNOTATING A PRIMARY IMAGE WITH AN IMAGE AND FOR TRANSMITTING THE ANNOTATED PRIMARY IMAGE

Charles R. Merritt, and Bonnie M. Merritt, both of 1116 Fairview Ave., San Jose, Calif. 95125

Filed Feb. 10, 1997, Appl. No. 798,519
Int. Cl.[7] G06F *17/00*
U.S. Cl. 707—512 **14 Claims**


42
48
Memo to Sam
I am sending the following request for a communications room for our department along with a firm out at the configuration of the room with existing equipment. Please comment on the request memo, equipment, equipment configuration, and the drawn message for the phone.
40
Capital Equipment Assessment Committee
32
In our pl for the coming year we are expanding our plans for communicating technical information with our customers. In order to maintain organization for the expanding responsibilities we would require space for the additional communication equipment. I understand that both 345 and 387 will be installed within the next month. Either room would suite our needs and we have configured our existing equipment as follows. Please contact me for additional information or your comment.
42
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1. In a computing network comprising a plurality of computing systems with each computing system comprising display means for displaying an image, input means for data entry, data storage means, memory means, and an application program stored on the storage means, the program comprising means for capturing a selected portion of an image displayed on the display means for generating a primary image, means for generating a plurality of secondary images having distinguishable attributes, means for selecting at least one secondary image for positioning the secondary image on the generated primary image and for activating the secondary image, means for selecting desired secondary images positioned on the primary image for activating the secondary image for generating an annotatory data input and display region associated with the secondary image, the annotatory region for inputting annotatory data to annotate the primary image and for displaying annotatory data with an associated activated secondary image for viewing annotations to the primary image, means for selectively displaying and hiding annotatory regions so that the regions do not interfere with viewing the primary image, and means for selectively displaying and hiding secondary images

positioned on the primary image, a method of superimposing a secondary image on a primary image for annotating the primary image and for routing the primary image through the computing network, the method comprising the steps of:

(1) invoking the application program for running the program;

(2) generating a display image on the display means;

(3) capturing a selected portion of the display image to generate a primary image;

(4) repeating step (3) for generating desired additional primary images;

(5) selecting a desired secondary image;

(6) positioning the selected secondary image on the primary image;

(7) activating the secondary image for generating the annotatory data input and display region of the associated secondary image;

(8) inputting annotatory data into the annotatory region;

(9) deactivating the associated secondary image for closing the annotatory data region of the associated secondary image;

(10) deselecting the secondary image;

(11) repeating steps (5) through (10) for each desired annotation to the primary image;

(12) generating a routing list of a plurality of users including a first user and subsequent users for transmitting at least one primary image from the first user to subsequent users in a predetermined sequence;

(13) transmitting at least one primary image from the first user to the subsequent users in the sequence prescribed by the routing list;

(14) notifying each subsequent user upon receipt of at least one primary image transmitted from the first user;

(15) upon notification of receipt of at least one primary image, a subsequent user invoking the application program stored on their computer for running the program to perform the following steps;

(16) calling a received primary image into memory for displaying the image on the display means;

(17) selecting a desired secondary image positioned on the primary image for activating the secondary image;

(18) activating the selected secondary image for generating the associated annotatory data region for displaying annotatory data in the region, the annotatory data in the region representative of annotations from the first user;

(19) deactivating the secondary image for closing the associated annotatory data region of the secondary image for hiding the annotatory data;

(20) deselecting the secondary image;

(21) repeating steps (17) through (20) for displaying desired annotations input by the first user;

(22) selecting a desired secondary image;

(23) positioning the selected secondary image on the primary image for activating the secondary image and activating the image for generating the associated annotatory data region for displaying annotatory data in the region;

(24) inputting additional annotatory data into the annotatory region to append the data to the annotatory data input by the first user;

(25) deactivating the associated secondary image for closing the annotatory data region for hiding the annotatory data and appended annotatory data from the primary image;

(26) deselecting the secondary image;

(27) repeating steps (22) through (26) for each desired appended annotation to the primary image;

(28) repeating steps (5) through (10) for each desired new annotation to the primary image;

(29) repeating steps (16) through (28) for each primary image received by the user; and

(30) transmitting each received and annotated primary image to a subsequent next user prescribed by the routing list.

6,041,336

CIRCUIT ARRANGEMENT FOR ARITHMETIC COMBINATION OF AN ANALOG SIGNAL WITH A DIGITAL VALUE AND METHOD AND CIRCUIT ARRANGEMENT FOR DETERMINATION OF AN ANGLE

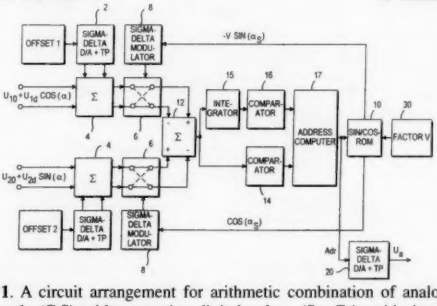
Siegbert Steinlechner, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 22, 1999, Appl. No. 296,729

Claims priority, application Germany, Apr. 29, 1998, 198 19 069

Int. Cl.[7] **G06J** *1/00;* **G06F** *7/38*

U.S. Cl. 708—4 **14 Claims**



1. A circuit arrangement for arithmetic combination of analog signals (C,S) with respective digital values (Ss, Cs), said circuit arrangement comprising

respective controllable sign reversing means (**6**) for switching said analog signals (C,S) with changed or unchanged sign, each of said sign reversing means (**6**) having a control input; and

respective sigma-delta modulators (**8**) for controlling said sign reversing means (**6**), said sigma-delta modulators (**8**) including means for producing a sequence of discrete output signals from said respective digital values (Ss, Cs), wherein said discrete output signals are +1 or −1 respectively according to said digital values (Ss,Cs) and said discrete output signals of the respective sigma-delta modulators (**8**) are input to the control inputs of the respective sign reversing means (**6**);

whereby a value of +1 at one of said control inputs causes a switching of said analog signal (C,S) input to said sign reversing means having said one of said control inputs with unchanged sign and a value of −1 at one of said control inputs causes a switching of said analog signal (C,S) input to said sign reversing means having said one of said control inputs with changed sign, or vice versa, so that the time average values of respective output signals of said sign reversing means corresponds to the desired arithmetic combination of the analog signal (C) and the digital value (Ss) and of the analog signal (S) and digital value (Cs) respectively.

6,041,337

LINEAR FUNCTION GENERATOR METHOD WITH COUNTER FOR IMPLEMENTATION OF CONTROL SIGNALS IN DIGITAL LOGIC

Bruce Ernest Whittaker, Mission Viejo, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

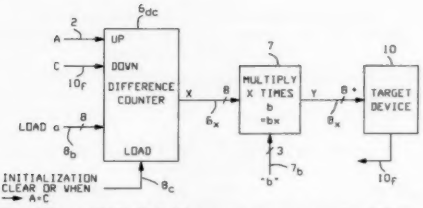
Filed Aug. 28, 1997, Appl. No. 980,358

Int. Cl.[7] **G06F** *17/11*

U.S. Cl. 708—274 **10 Claims**

1. A method for flexibly expanding a digital bus input signal with an efficient implementation for a linear function utilizing spare gates in a Programmable Logic Array or Field Programmable Gate Array for generating an output digital signal for controlling a target digital modules comprising the steps of:

(a) generating a difference signal Xd in an UP-DOWN counter module which represents the value of a source-setting pulse stream signal (A) reduced by a feedback pulse stream digital signal (C);



(b) adding a N-bit digital intercept parameter value "a" to said Xd signal to generate an N-bit digital signal, such that Xd+a=Xa.

(c) multiplying said N-bit digital signal Xa by a slope parameter "b" to develop an (N+q) bit digital output signal Y, where q represents the digital offset value in binary notation corresponding to the specific value of the slope parameter "b" such that bXa=Y and thus Y=bXd+ba.

6,041,338

INTERPOLATION FILTER SYSTEM

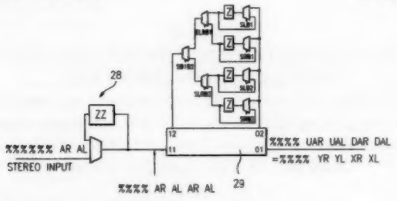
Dong-Hwan Han, Kyungki-do, Rep. of Korea, assignor to LG Semicon, Co., Ltd., Cheongju, Rep. of Korea

Filed Mar. 5, 1998, Appl. No. 35,016

Claims priority, application Rep. of Korea, May 6, 1997, 97-17319

Int. Cl.[7] **G06F** *17/10;17/17*

U.S. Cl. 708—313 **15 Claims**



1. A data interpolating filter, comprising:

a sample and hold part that samples and holds data, and that selectively provides the sampled and held data for at least two different channels; and

a wave digital filter that filters the sampled and held data from the sample and hold part to produce interpolated data.

6,041,339

EFFICIENT DECIMATION FILTERING

Xianggang Yu; Terry Lee Sculley, and Jeffrey Alan Niehaus, all of Austin, Tex., assignors to ESS Technology, Inc., Austin, Tex.

Filed Mar. 27, 1998, Appl. No. 49,604

Int. Cl.[7] **G06F** *17/10*

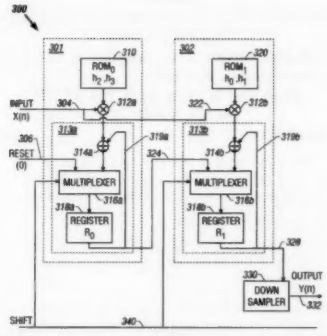
U.S. Cl. 708—313 **50 Claims**

1. An electronic circuit, comprising:

an input terminal operable to receive a series of input data samples at an input sampling rate;

at least one memory unit configured to store a specified set of digital filtering coefficients which are designed to perform a filtering operation on said input data samples; and

a plurality of signal processing stages each connected to said input terminal and said memory unit and configured to include a multiplier operable to multiply an iaput data sample by a selected coefficient in said memory unit, an accumulator connected to receive an output from said multiplier and configured to perform accumulations, and a register connected to receive accumulated data from said accumulator or data from



a source outside said processing stage and to feed said accumulated data back to said accumulator for a subsequent accumulation,

wherein said signal processing stages are further interconnected in series for shifting an accumulated result from one processing stage to a succeeding processing stage after a specified number of accumulations are completed in each processing stage in response to a shift command.

6,041,340

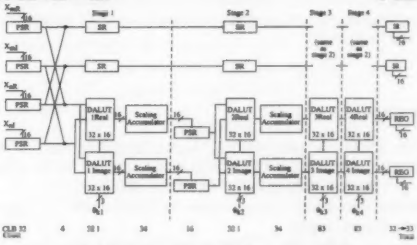
METHOD FOR CONFIGURING AN FPGA FOR LARGE FFTS AND OTHER VECTOR ROTATION COMPUTATIONS

Lester Mintzer, Santa Ana, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Division of application No. 08/815,019, Mar. 14, 1997, Pat. No. 5,991,788. This application Dec. 15, 1998, Appl. No. 211,604.

Int. Cl.[7] **G06F** *15/00;7/52*

U.S. Cl. 708—403 **4 Claims**



1. A method of configuring a field programmable gate array (FPGA) for carrying out a fast Fourier transform (FFT) computation implemented by a complex multiplication $(X+jy)e^{-j\theta}$ which can be expressed as sums of transform partial products, each term having a trigonometric coefficient and sums and differences of real and imaginary input variables X and Y, the FPGA having an array of look-up-tables in respective logic blocks; the method comprising the steps of:

a) loading said look-up-tables with the arithmetic sums of said transform partial products;

b) applying said input variables to respective parallel-to-serial registers;

c) inputting sums and differences of serial register stored input variables as address inputs to the look-up-tables;

d) storing real and imaginary outputs of said look-up-tables in respective registers;

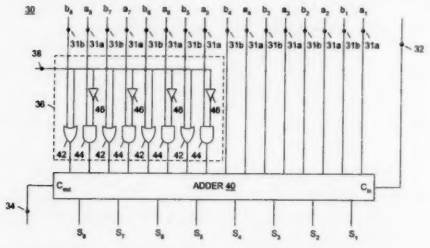
e) scaling and accumulating said outputs as a stare computational output; and

f) repeating steps a) through e) for a plurality of subsequent stages of progressively smaller increments of θ and transferring the computational output of each such stare to the next successive stage as the input thereto.

6,041,341
METHOD AND CIRCUIT FOR ADDING OPERANDS OF MULTIPLE SIZE

Eric W. Mahurin, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 8, 1998, Appl. No. 57,138
Int. Cl.[7] G06F *7/50*
U.S. Cl. 708—700 **15 Claims**

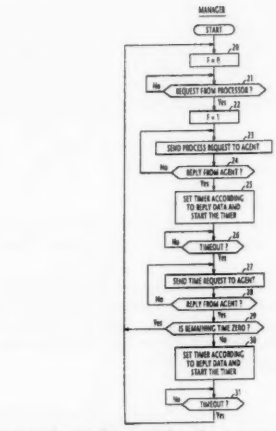


1. A method of adding operands comprising the steps:
inputting a first m bit operand into m least significant first inputs of an n bit adder, where n is greater than m;
inputting a second m bit operand into m least significant second inputs of the n bit adder;
inputting a first (n-m) bit operand into the (n-m) most significant first inputs of the n bit adder, wherein each bit of the first (n-m) bit operand represents logical zero;
inputting a second (n-m) bit operand into the most significant (n-m) second inputs of the n bit adder, wherein each bit of the second (n-m) bit operand represents logical one;
inputting a carry in bit into a carry input of the adder;
wherein the first m bit operand, second m bit operand, first (n-m) bit operand, the second (n-m) bit operand, and the carry in bit are all inputted into the n bit adder in parallel;
generating a set of n carry out bits;
generating an n bit output operand, and;
wherein the least significant m bits of the n bit output operand and the most significant carry out bit represent a result of adding the first m bit operand, the second m bit operand, and the carry in bit.

6,041,342
LOW TRAFFIC NETWORK MANAGEMENT METHOD USING ESTIMATED PROCESS EXECUTION TIME FOR MANAGER-AGENT SYNCHRONIZATION

Yasuhiro Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1998, Appl. No. 109,874
Claims priority, application Japan, Jul. 2, 1997, 9-176254
Int. Cl.[7] G06F *17/00*
U.S. Cl. 709—202 **5 Claims**

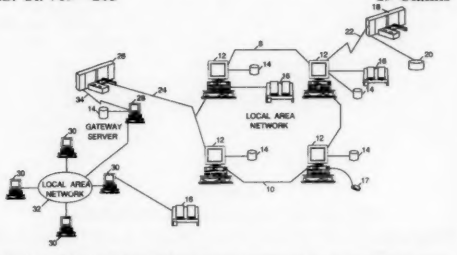


1. A management method for a communication network wherein a management station is connected to at least one agent station, comprising the steps of:
a) transmitting an execution request message from the management station to said agent station for requesting the agent station to execute a process;
b) responsive to the execution request message, estimating, at said agent station, a length of time taken to execute the process and transmitting a first reply message to the management station, indicating said length of time, and subsequently estimating a length of time remaining to execute said process;
c) setting a timer, at said management station, according to the length of time contained in the first reply message, starting the timer, and transmitting a time request message to the agent station when said timer expires;
d) responsive to the time request message, transmitting, from the agent station to the management station, a second reply message indicating the estimated length of remaining time; and
e) responsive to the second reply message, determining, at said management station, that the requested process has been executed if the second reply message indicates that the length of remaining time is zero, or setting the timer according to the second reply message if the length of remaining time is nonzero, starting the timer, and determining that the requested process has been executed when the timer expires.

6,041,343
METHOD AND SYSTEM FOR A HYBRID PEER-SERVER COMMUNICATIONS STRUCTURE

Binh Q. Nguyen; Richard J. Redpath, both of Cary, and Sandeep Kishan Singhal, Raleigh, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 19, 1996, Appl. No. 769,564
Int. Cl.[7] G06F *13/00*
U.S. Cl. 709—203 **19 Claims**



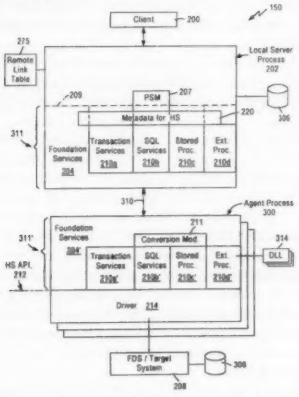
1. A method of increasing server capacity on a network computer system, comprising the steps of:
determining a total number of destination addresses that an individual client will directly communicate with so as to provide a peer address total;
assigning a plurality of destination addresses peer addresses with which the individual client communicates directly or server addresses corresponding to destination addresses handled by a server interconnected to the individual client on the network such that destination addresses are assigned as peer addresses until the peer address total is reached to thereby reduce a total number of destination addresses handled by the server by up to the peer address total;
wherein any destination addresses in excess of the peer address total are assigned as server addresses; and
communicating utilizing the peer addresses.

6,041,344

APPARATUS AND METHOD FOR PASSING STATEMENTS TO FOREIGN DATABASES BY USING A VIRTUAL PACKAGE

Roger Bodamer; Jacco Draaijer, both of Mountain View; Eric Voss, Foster City, and Raghu Mani, Mountain View, all of Calif., assignors to Oracle Corporation, Redwood Shores, Calif.

Filed Jun. 23, 1997, Appl. No. 880,325
Int. Cl.[7] G06F *15/16*
U.S. Cl. 709—203 **20 Claims**



14. A computer system configured to respond to a plurality of requests, comprising:

a local server process configured for:

receiving the requests, each of the requests including a respective statement that can be performed by a foreign database server and a reference to the database server, each respective statement including at least one operation necessary for execution that cannot be performed by the local server process; and

determining the operations necessary for execution of the respective statements; and

an agent process configured for:

collecting the statements included in the requests into a single call request for the foreign database server; and

sending the single call request to the foreign database server based on the corresponding reference in the statement;

wherein the local server process is further configured for receiving results from the foreign process generated in response to the single call request.

6,041,345

ACTIVE STREAM FORMAT FOR HOLDING MULTIPLE MEDIA STREAMS

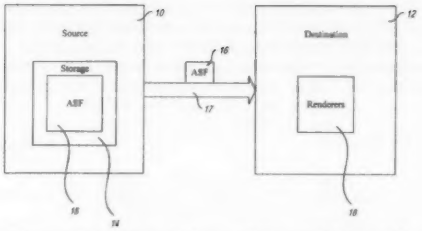
Steven P. Levi, Redmond; Mark D. VanAntwerp, Seattle; Craig M. Dowell, Redmond, and Chadd B. Knowlton, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Provisional application No. 60/013,029, Mar. 8, 1996, Provisional application No. 60/028,789, Oct. 21, 1996. This application Mar. 7, 1997, Appl. No. 813,151.
Int. Cl.[7] G06F *17/50*
U.S. Cl. 709—217 **21 Claims**

1. In a computer system operable for connecting to a transport medium, a method of encapsulating multiple streams of data into an aggregated data stream to be transmitted on the transport medium comprising:

determining a packet size for the transport medium;

storing, on a storage device, at least one packet containing information about the aggregated data stream to form a header section in a logical structure that defines the aggregated data stream;



storing, on the storage device, packets containing samples of data from the multiple data streams to form a data section in the logical structure;

designating a portion of at least one packet in the data section for holding error correcting data; and

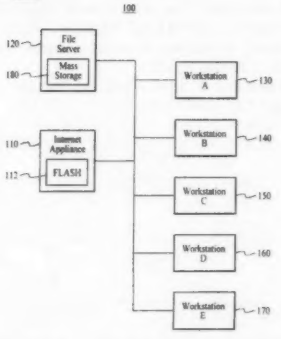
storing, on the storage device, error correcting data in the designated portion of the at least one packet in the data section, wherein the error correcting data identifies a corresponding error correcting method for each of the encapsulated data streams, and further wherein the aggregated data stream is stored on the storage device prior to receiving a request for transmission of the aggregated data stream on the transport medium from a destination computer.

6,041,346

METHOD AND SYSTEM FOR PROVIDING REMOTE STORAGE FOR AN INTERNET APPLIANCE

Ben W. Chen, and Bo Xiong, both of Fremont, Calif., assignors to Ateon Networks, Inc., Fremont, Calif.

Filed Oct. 17, 1997, Appl. No. 953,029
Int. Cl.[7] G06F *13/00*
U.S. Cl. 709—218 **40 Claims**



1. A system for providing access to a remote network comprising:

an internet appliance; and

a first component coupled with the internet appliance and having a mass storage device, a portion of the mass storage device being sharable with and mapped to the internet appliance;

wherein the internet appliance is capable of using any component that is coupled with the internet appliance and that includes the mass storage device as the first component.

6,041,347

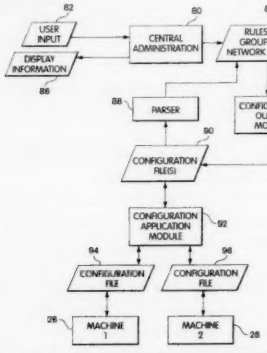
COMPUTER SYSTEM AND COMPUTER-IMPLEMENTED PROCESS FOR SIMULTANEOUS CONFIGURATION AND MONITORING OF A COMPUTER NETWORK

Bret Harsham, Newton, and Lalit Jain, Boston, both of Mass., assignors to Unified Access Communications, Boston, Mass.

Filed Oct. 24, 1997, Appl. No. 957,048

Int. Cl.[7] **G06F** *15/00;15/40;9/44*

U.S. Cl. 709—220 **26 Claims**



1. A computer implemented process for simultaneously configuring parameters of devices in a computer network, comprising the steps of:

defining a hierarchy of logical groups of objects corresponding to machines and groups of machines in the computer network;

defining rules associated with the objects, wherein a rule specifies a type of traffic, a communication protocol, and indication of whether the rule is associated with the object acting as a sender or as a receiver of information, wherein each object inherits all rules associated with each group in which it is a member;

processing the defined rules to produce a set of control parameters for machines in the computer network; and

applying the control parameters to machines in the computer network.

6,041,348

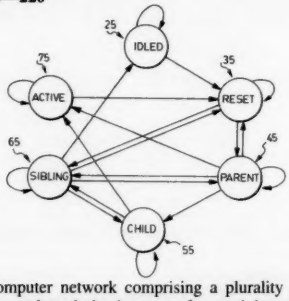
N-PORT ALGORITHM FOR DISABLING A NODE WITHIN A NETWORK DURING RESET

Michael B. Smith, Etobicoke, Canada, assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 1, 1997, Appl. No. 982,263

Int. Cl.[7] **G06F** *13/00;15/00;11/00;1/24*

U.S. Cl. 709—220 **26 Claims**



1. In a computer network comprising a plurality of interconnected nodes, each node having ports for receiving and transmitting information to ports of other nodes, each port in each node having a port module associated therewith, each port module in a node having a priority in the node, each node in the network having a unique identifier which is transmitted by each node during reset of the computer network, a process for identifying which ports in one of the plurality of interconnected nodes can be disabled during reset of the network, said process comprising the steps of:

(a) for each port module in said one of the nodes, commencing with the port module having the highest priority in said one of the nodes;

(i) determining, between a predetermined unique identifier and a unique identifier being received by the port from other nodes, which unique identifier satisfies a first set of predetermined conditions;

(ii) transmitting, from the port to other nodes, the unique identifier which has been determined by the associated port module satisfies the first set of predetermined conditions for the port;

(iii) sending to the next highest priority port module in the node the unique identifier which has been determined by the port module to satisfy the first set of predetermined conditions;

(iv) determining, between the unique identifier sent from the higher priority port module of said one of the nodes and a unique identifier being received by the port associated with the next highest priority port module of said one of the nodes, which unique identifier satisfies the first set of predetermined conditions; and

(v) repeating steps (ii) to (iv) for each port module in said one of the nodes in the order of priority until each port of said one of the nodes is transmitting an identical unique identifier number that satisfies the first set of predetermined conditions, said identical unique identifier being transmitted by each port corresponding to a root node of the plurality of nodes;

(b) for each port that is receiving the identical unique identifier from the root node, disabling one of the ports receiving the identical unique identifier from the root node.

6,041,349

SYSTEM MANAGEMENT/NETWORK CORRESPONDENCE DISPLAY METHOD AND SYSTEM THEREFOR

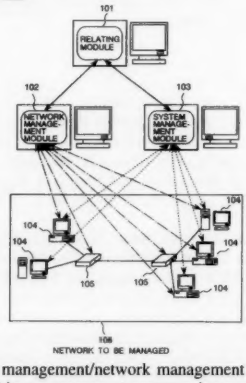
Kiminori Sugauchi, Yokohama; Toshiaki Hirata, Kashiwa; Kenya Nishiki, Fujisawa; Satoshi Miyazaki, Yamato; Keizo Mizuguchi, Naka-gun, and Shuji Fujino, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1997, Appl. No. 808,916

Claims priority, application Japan, Feb. 29, 1996, 8-042454

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 709—223 **12 Claims**



1. A system management/network management correspondence display method in a management system using a network management module managing network resource information including network configuration, and a system management module managing system resource information including a client/server configuration of a computer network including a plurality of computers, comprising:

displaying a network management map for managing said computer network, or a client/server configuration map for managing said system;

designating a managed object on said network management map or on said client/server configuration map;

collecting an identifier of said managed object in a first module in said network management module and said system management module, based upon the management information which is managed by a second module in common with said first module, using said network management map or said system map;

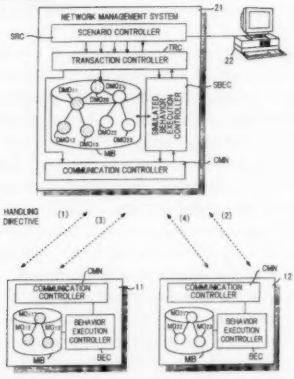
displaying said client/server configuration to which said managed object relates with at least one display symbol, when said second module is a client/server configuration module; and,

displaying said network configuration to which said managed object relates with at least one display symbol, when said second module is a network configuration module.

6,041,350
NETWORK MANAGEMENT SYSTEM BASED UPON MANAGED OBJECTS

Minoru Takimoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 16, 1998, Appl. No. 39,775
Claims priority, application Japan, Oct. 20, 1997, 9-287100
Int. Cl.[7] G06F *15/16*
U.S. Cl. 709—223 **7 Claims**



1. A network management system, which is connected to one or a plurality of network element management systems each connected to one or more network elements, for performing network management via these network element management systems, comprising:

a management information database for storing duplicate managed objects that are duplicates of a number of managed objects which are generated in order to manage states of network resources and managed in the network element management system;

a simulated behavior execution controller for simulating behavior of a managed object, which is executed in each network element management system, as behavior of a duplicate managed object that has been stored in said management information database;

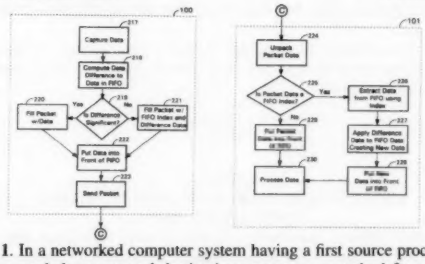
a transaction controller for performing control to deliver a series of handling directives for a prescribed managed object managed in each of the network element management systems to said simulated behavior execution controller, cause modified content that is based upon simulated behaviors to be reflected in said management information database if the simulated behaviors with regard to all handling directives end normally, and discard modified content with regard to all managed objects so that this modified content will not be reflected in said management information database if there is even one handling directive that ends abnormally; and

a communication controller for delaying the series of handling directives for each of the network element management systems until all simulated behavior execution control ends normally.

6,041,351
NETWORK TRAFFIC BY INSTRUCTION PACKET SIZE REDUCTION

Samuel P. Kho, Sunnyvale, Calif., assignor to Newmoon.Com, San Jose, Calif.

Filed Apr. 17, 1997, Appl. No. 843,919
Int. Cl.[7] G06F *13/00*
U.S. Cl. 709—224 **14 Claims**


Capture Data
Compute Data Difference to Data in FIFO
Is Difference Significant?
Fill Packet w/ Data
Fill Packet w/ FIFO Index and Difference Data
Put Data into Front of FIFO
Send Packet
Unpack Packet Data
Is Packet Data a FIFO Index?
Extract Data from FIFO using Index
Put Packet Data into Front of FIFO
Apply Difference Data to FIFO Data Creating New Data
Process Data
Put New Data into Front of FIFO

1. In a networked computer system having a first source processor coupled to a second destination processor, a method for processor communication comprising the steps of:

a first source processor sending an unrequested first instruction to a second processor;

the second destination processor monitoring and executing the first instruction;

the first source processor sending an unrequested second instruction representing the first instruction to the second destination processor, wherein the second instruction comprises an unaltered instruction or a short instruction depending on a difference determined by the first source processor by comparing the first instruction against data provided in a locally-accessible storage, the first instruction being sent by the first source processor to the second destination processor effectively on a non-repetitive basis; and

the second destination processor monitoring and executing the first instruction.

6,041,352
RESPONSE TIME MEASURING SYSTEM AND METHOD FOR DETERMINING AND ISOLATING TIME DELAYS WITHIN A NETWORK

Matt Burdick, San Jose, and Gigi Chu, Santa Clara, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1998, Appl. No. 12,543
Int. Cl.[7] G06F *11/14*
U.S. Cl. 709—224 **33 Claims**

17. A method, comprising the steps of:

(a) detecting a first signal at a first point within a network;

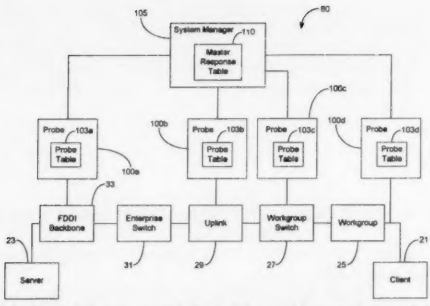
(b) detecting said first signal at a second point within said network;

(c) detecting a second signal at said first point within said network;

(d) detecting said second signal at said second point within said network;

(e) identifying said first signal as a request signal and said second signal as a response signal associated with said request signal; and

(f) determining a first time delay, said first time delay indicating an amount of time between steps (a) and (c);



(g) determining a second time delay, said second time delay indicating an amount of time between steps (b) and (d);

(h) comparing said first time delay with said second time delay; and

(i) automatically determining whether a data transfer problem exists between said first and second points based on said comparing step.

6,041,353

METHOD FOR SEARCHING FOR NETWORK CONNECTION PATH

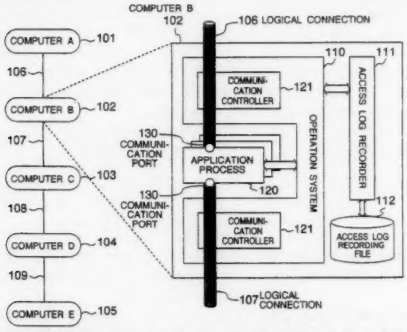
Toshiaki Hirata, Kashiwa; Akihiro Urano, Fujisawa; Shuji Fujino, Ebina; Mitsugu Yamada, Yokohama; Hidetomo Nakano, Fujisawa, all of Japan; Shinji Morita, Lexington, Mass., and Satoshi Miyazaki, Yamato, Japan, assignors to Hitachi, Ltd., and Hitachi Information Network, Ltd., both of Tokyo, Japan

Filed Apr. 21, 1998, Appl. No. 63,445

Claims priority, application Japan, Apr. 22, 1997, 9-104728

Int. Cl.[7] G06F *13/00*

U.S. Cl. 709—224 **21 Claims**



1. A method for searching for a network connecting path comprising the steps of:

issuing a search request from a computer which detected a search objective user to a first computer with which established a logical connection associated with the search objective user to require the first computer to perform searching operation;

selecting users who used a searched computer in a use time of the search objective user and issuing a search request to computers with which the searched computer established logical connections associated with the selected users to require the connection-established computers to perform a searching operation;

sequentially performing said search request over m candidates of a logical connection originator computer as a searched computer up to the m-th candidate computer; and

collecting in the respective computers the computer identifier of the searched computer and user identifiers of the selected users as search results sequentially obtained by the m computers while returning to the search objective user detection computer in an order opposite to the search request order.

6,041,354

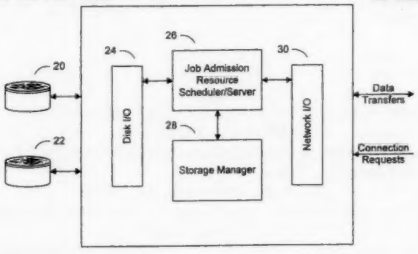
DYNAMIC HIERARCHICAL NETWORK RESOURCE SCHEDULING FOR CONTINUOUS MEDIA

Alexandros Biliris, Chatham; Bruce K. Hillyer, Colts Neck, and Euthimios Panagos, Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 8, 1995, Appl. No. 525,937

Int. Cl.[7] G06F *13/14*

U.S. Cl. 709—226 **16 Claims**



1. A method of playing back continuous media data comprising the steps of:

performing job admission based on loading of a server;

performing hierarchically scheduling of a plurality of resources based on an estimate of consumption of a plurality of data streams from each of said plurality of resources with respect to available time during a single schedule cycle of a plurality of schedule cycles substantially ensuring completion of at least one of said plurality of data streams within a particular time frame of said single schedule cycle;

dynamically monitoring actual resource consumption to improve utilization of said plurality of resources with conservative admission at beginning of said single cycle and slack filling additional available time during said particular time frame of said single cycle;

degrading a first part of one of said plurality of data streams with respect to a second part of one of said plurality of data streams deemed less important according to an application specified prioritization policy of said server.

6,041,355

METHOD FOR TRANSFERRING DATA BETWEEN A NETWORK OF COMPUTERS DYNAMICALLY BASED ON TAG INFORMATION

James E. Toga, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

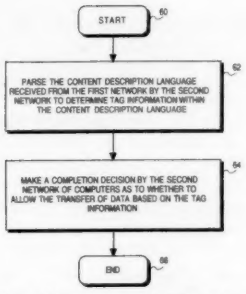
Filed Dec. 27, 1996, Appl. No. 773,602

Int. Cl.[7] G06F *13/00;15/16*

U.S. Cl. 709—227 **17 Claims**

1. A method of controlling transfer of data between a first network of computers and a second network of computers, the method comprising the steps of:

(a) parsing content description language received from the first network of computers by the second network of computers to determine current tag information within the content description language; and


START
60
PARSE THE CONTENT DESCRIPTION LANGUAGE RECEIVED FROM THE FIRST NETWORK BY THE SECOND NETWORK TO DETERMINE TAG INFORMATION WITHIN THE CONTENT DESCRIPTION LANGUAGE
62
MAKE A COMPLETION DECISION BY THE SECOND NETWORK OF COMPUTERS AS TO WHETHER TO ALLOW THE TRANSFER OF DATA BASED ON THE TAG INFORMATION
64
END
66

(b) dynamically making a completion decision by the second network of computers as to whether to allow the transfer of data based on the current tag information, wherein the completion decision is based upon a resource constraint of the second network of computers.

6,041,356

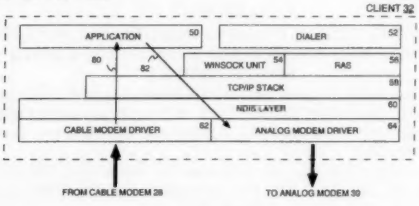
METHOD AND APPARATUS FOR DETECTING NETWORK TRAFFIC AND INITIATING A DIAL-UP CONNECTION USING SEPARATE UPSTREAM AND DOWNSTREAM DEVICES

Mannan Mohammed, Chandler, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1997, Appl. No. 829,584

Int. Cl.[7] **G06F** *13/00;3/00;15/74*

U.S. Cl. 709—227 **12 Claims**



1. In a client having (i) an upstream device driver for controlling an upstream device which sends data to a server; (ii) a downstream device driver for controlling a downstream device which receives data from said server, said upstream device driver and said downstream device driver being separate drivers for separate devices; and (iii) a dialer application for establishing an upstream connection using said upstream device driver, a method for initiating a connection with said server in response to upstream traffic generated by an application in said client comprising the steps of:

receiving said upstream traffic in said downstream device driver, said downstream device driver being incapable of transmitting said upstream traffic;

constructing a dial packet in said downstream device driver in response to said upstream traffic;

transferring said dial packet from said downstream device driver to said dialer application; and,

issuing a call command to said upstream device driver.

6,041,357

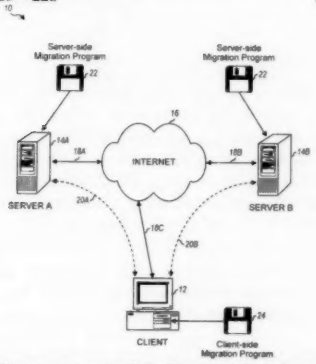
COMMON SESSION TOKEN SYSTEM AND PROTOCOL

Kevin Kunzelman, San Francisco, and Sterling Hutto, Sausalito, both of Calif., assignors to Electric Classified, Inc., San Francisco, Calif.

Filed Feb. 6, 1997, Appl. No. 796,260

Int. Cl.[7] **H04L** *9/00;* **G06F** *13/14*

U.S. Cl. 709—228 **13 Claims**



1. In a client-server network having multiple independent servers, a method of session migration from a session between a client and a first server to a session between the client and a second server;

establishing a current session between the client and the first server after the first server has verified that th e client is an authorized client of the first server;

sending a migration request from the client to the first server;

in response to the migration request generating a session token;

sending a session token from the first server to the client, wherein the session token uniquely identifies the current session between the client and the first server;

sending the session token from the client to the second server as a request to the second server for migration;

verifying, at the second server and from the session token, the identity of the client and the first server;

requesting, from the first server, data about the session, wherein the request is sent from the second server;

responding from the first server to the request for data by sending the requested data to the second server; and

if the client is an authorized client with respect to the second server, continuing the session with the second server in place of the first server.

6,041,358

METHOD FOR MAINTAINING VIRTUAL LOCAL AREA NETWORKS WITH MOBILE TERMINALS IN AN ATM NETWORK

Nen-Fu Huang; Yao-Tzung Wang, both of Hsinchu, and Trung-Pao Lin, Kaohsiung, all of Taiwan, assignors to Industrial Technology Research Inst., Hsinchu, Taiwan

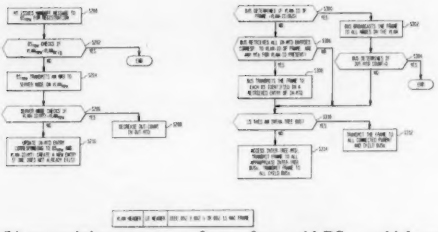
Filed Nov. 12, 1996, Appl. No. 747,696

Int. Cl.[7] **G06F** *13/00;* **H04B** *7/26;* **H04L** *12/66*

U.S. Cl. 709—238 **24 Claims**

1. In an asynchronous transfer mode (ATM) network, wherein a plurality of virtual local area network (VLAN) server nodes are connected by virtual channels into plural trees, wherein at least some of said VLANs comprise base stations (BSs) capable of providing packet communication for one or more mobile terminals (MTs), a method of tracking a location of each MT comprising the steps of:

(a) maintaining in an original BS (BS_{orig}) on an original VLAN ($VLAN_{orig}$) a record corresponding to each MT for which said BS_{orig} provides packet communication which record contains an identifier (VLAN-ID) of one of said VLANs which said MT is on (VLAN-ID(MT)),



(b) transmitting a message frame, from said BS_{orig} which currently provides packet communication for an MT, to a server node of said $VLAN_{orig}$, said message frame, containing said VLAN-ID(MT), a VLAN-ID of a new VLAN ($VLAN_{new}$) and an ATM address of said BS_{orig} (ATM(BS_{orig})),

(c1) if said MT is on said $VLAN_{orig}$, increasing said number of MTs on $VLAN_{orig}$ which have moved; and

(c) receiving said message frame at said server node of said $VLAN_{orig}$ and updating a mobility terminal membership tracking database (MTD) maintained at said server node to reflect said movement of said MT.

6,041,359

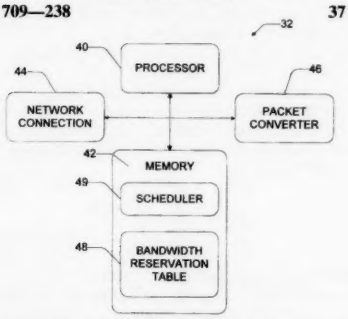
DATA DELIVERY SYSTEM AND METHOD FOR DELIVERING COMPUTER DATA OVER A BROADCAST NETWORK

Kenneth J. Birdwell, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jun. 9, 1997, Appl. No. 871,655

Int. Cl.[7] G06F *15/16*

U.S. Cl. 709—238 **37 Claims**



17. In a network system having multiple content servers serving data to multiple clients over a distribution network with a bi-directional link and a unidirectional broadcast link, the content servers sending the data over the bi-directional link in a first format, a reservation computing unit comprising:

a network port to provide access to the bi-directional link of the distribution network, the network port receiving bandwidth reservation requests from the content servers requesting reservation of bandwidth on the data network;

a scheduler to schedule bandwidth reservations for the content servers in response to the requests;

a second port to provide access to the unidirectional broadcast link of the distribution network; and

a data format converter to convert the data from the first format into a second format for transmission over the unidirectional broadcast link of the distribution network.

6,041,360

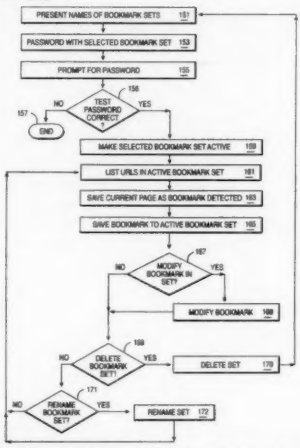
WEB BROWSER SUPPORT FOR DYNAMIC UPDATE OF BOOKMARKS

Maria Azua Himmel, and Herman Rodriguez, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1997, Appl. No. 976,266

Int. Cl.[7] G06F *17/30*

U.S. Cl. 709—245 **28 Claims**



1. A method for providing access to the Internet using bookmarks comprising the steps of:

storing a first bookmark in a bookmark store of a browser in a computer system, the first bookmark to a web page at a Uniform Resource Locator (URL);

setting a dynamic attribute for the first bookmark;

detecting a change in the URL incorporated in the first bookmark; and

automatically updating the URL in the first bookmark.

6,041,361

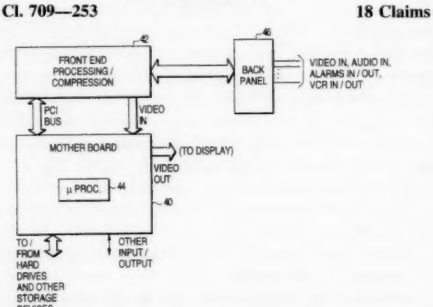
DIGITAL VIDEO RECORDER PROVIDING SEPARATE PIPELINING FOR ODD AND EVEN FIELDS FROM A SINGLE CAMERA

Charles Park Wilson, Santee; Gerhard Josef Winter, and David Ross MacCormack, both of San Diego, all of Calif., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Continuation-in-part of application No. 08/741,983, Oct. 31, 1996, Pat. No. 5,854,902. This application Apr. 29, 1998, Appl. No. 67,991.

Int. Cl.[7] H04N *9/79*

U.S. Cl. 709—253 **18 Claims**



1. Apparatus for storing video signals, comprising:

a first video camera;

a second video camera;

conversion means, connected to said video cameras, for selectively converting video signals generated by said video cameras into digital video signals;

storage means, connected to said conversion means, for storing said digital video signals; and

control means, connected to said conversion means and said storage means, for controlling said conversion means and said storage means; wherein:

said video cameras each generate video signals according to an interlaced video signal standard in which said cameras each alternately generate odd signal fields and even signal fields, said odd signal fields corresponding to odd-numbered horizontal scan lines of an image plane and said even signal fields corresponding to even-numbered horizontal scan lines of said image plane; and

said control means controls said conversion means and said storage means so that said storage means stores digital video signals representing both odd and even signal fields generated by said first video camera, and also stores only one of:

(a) digital video signals representing exclusively odd signal fields generated by said second video camera; and

(b) digital video signals representing exclusively even signal fields generated by said second video camera.

6,041,362

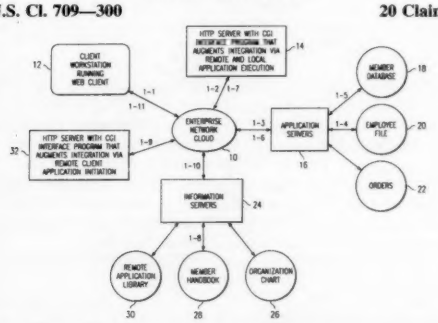
METHOD AND SYSTEM FOR INTEGRATING DISPARATE INFORMATION TECHNOLOGY APPLICATIONS AND PLATFORMS ACROSS AN ENTERPRISE

Randall F. Mears, Plano, and Brad L. Rucker, Allen, both of Tex., assignors to Electronics Data Systems Corporation, Plano, Tex.

Filed Oct. 20, 1995, Appl. No. 546,390

Int. Cl.[7] G06F *17/30*

U.S. Cl. 709—300 **20 Claims**



1. A system for connecting a web client to an enterprise network having a plurality of disparate applications and platforms, comprising:

a web client;

a predetermined information interface form for interfacing the web client with an enterprise network; and

an application server that connects the web client to the enterprise network, the application server operable to initiate the updating of information in a first disparate application in response to information received from a second disparate application.

6,041,363

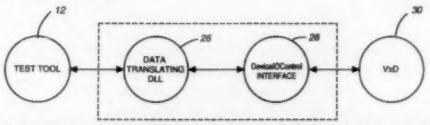
IMBEDDING VIRTUAL DEVICE DRIVER (VXD) CALLS IN A DYNAMIC LINK LIBRARY (DLL)

Daniel H. Schaffer, Colorado Springs, Colo., assignor to Sun Microsystems, Inc,, Palo Alto, Calif.

Filed Mar. 29, 1996, Appl. No. 622,886

Int. Cl.[7] G06F *15/163;9/00;9/46*

U.S. Cl. 709—301 **11 Claims**



1. Apparatus for accessing a virtual device driver in an operating system in a computer from a test tool calling program to perform and verify the performance of requested operations of the virtual device driver, wherein the test tool calling program does not support communication to and from a DeviceIOControl interface that provides an interface to the virtual device driver, the apparatus comprising:

a dynamic link library providing an interface to the calling program;

a DeviceIOControl interface providing an interface to the virtual device driver;

a connection connecting the dynamic link library to the DeviceIOControl interface;

a decoder module in the dynamic link library for decoding a request received from the calling program to perform a requested operation accessing the virtual device driver, the request having request data identifying the requested operation;

an acquisition module in the dynamic link library for acquiring an address of the virtual device driver from the operating system;

a setup module in the dynamic link library for configuring data parameters in accordance with the request, the data parameters enabling the dynamic link library to access the virtual device driver through the DeviceIOControl interface;

a calling module in the dynamic link library for calling the DeviceIOControl interface and for passing the data parameters, the acquired address, and the request data to the DeviceIOControl interface to enable the DeviceIOControl interface to request the virtual device driver to perform the requested operation;

a receiver in the DeviceIOControl interface for receiving from the virtual device driver a return value after the virtual device driver has performed the requested operation, the return value indicating the success or failure of the requested operation; and

a return module in the dynamic link library for receiving the return value from the DeviceIOControl interface and for passing the return value to the calling program.

6,041,364

METHOD AND SYSTEM FOR ADDING A DEVICE ENTRY TO A DEVICE TREE UPON DETECTING THE CONNECTION OF A DEVICE

Victor Lortz, and Stephen T. Chou, both of Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1996, Appl. No. 769,787

Int. Cl.[7] G06F *13/10*

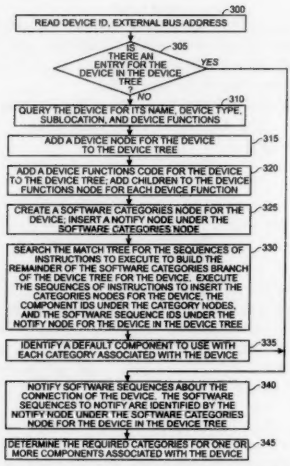
U.S. Cl. 709—301 **11 Claims**

1. A method comprising:

detecting a connection of a device;

searching a device tree to determine if said device has been connected for the first time;

if said device has been connected for the first time, adding a device entry for said device to said device tree, associating with said device entry in said device tree a device type and at least one device function;


READ DEVICE ID, EXTERNAL BUS ADDRESS
300
IS THERE AN ENTRY FOR THE DEVICE IN THE DEVICE TREE ?
305
YES
NO
QUERY THE DEVICE FOR ITS NAME, DEVICE TYPE, SUBLOCATION, AND DEVICE FUNCTIONS
310
ADD A DEVICE NODE FOR THE DEVICE TO THE DEVICE TREE
315
ADD A DEVICE FUNCTIONS CODE FOR THE DEVICE TO THE DEVICE TREE; ADD CHILDREN TO THE DEVICE FUNCTIONS NODE FOR EACH DEVICE FUNCTION
320
CREATE A SOFTWARE CATEGORIES NODE FOR THE DEVICE; INSERT A NOTIFY NODE UNDER THE SOFTWARE CATEGORIES NODE
325
SEARCH THE MATCH TREE FOR THE SEQUENCES OF INSTRUCTIONS TO EXECUTE TO BUILD THE REMAINDER OF THE SOFTWARE CATEGORIES BRANCH OF THE DEVICE TREE FOR THE DEVICE. EXECUTE THE SEQUENCES OF INSTRUCTIONS TO INSERT THE CATEGORIES NODES FOR THE DEVICE, THE COMPONENT IDS UNDER THE CATEGORY NODES, AND THE SOFTWARE SEQUENCE IDS UNDER THE NOTIFY NODE FOR THE DEVICE IN THE DEVICE TREE
330
IDENTIFY A DEFAULT COMPONENT TO USE WITH EACH CATEGORY ASSOCIATED WITH THE DEVICE
335
NOTIFY SOFTWARE SEQUENCES ABOUT THE CONNECTION OF THE DEVICE. THE SOFTWARE SEQUENCES TO NOTIFY ARE IDENTIFIED BY THE NOTIFY NODE UNDER THE SOFTWARE CATEGORIES NODE FOR THE DEVICE IN THE DEVICE TREE
340
DETERMINE THE REQUIRED CATEGORIES FOR ONE OR MORE COMPONENTS ASSOCIATED WITH THE DEVICE
345

searching a match tree using said device type and said device function to identify at least one first sequence of instructions to execute when said device is connected for the first time; and

executing said at least one first sequence of instructions to associate with said device in said device tree at least one software category.

6,041,365

APPARATUS AND METHOD FOR HIGH PERFORMANCE REMOTE APPLICATION GATEWAY SERVERS

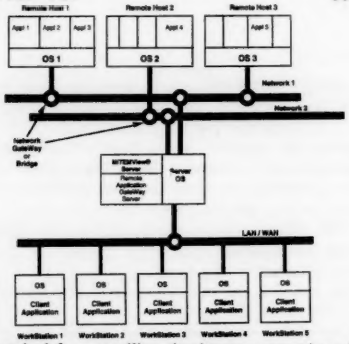
Aurel Kleinerman, 307 Waverly St. #5, Menlo Park, Calif. 94025

Continuation-in-part of application No. 08/542,863, Oct. 13, 1995, Pat. No. 5,734,871, which is a continuation of application No. 08/406,638, Mar. 20, 1995, abandoned, which is a continuation of application No. 08/261,764, Jun. 17, 1994, abandoned, which is a continuation of application No. 08/089,947, Jul. 12, 1993, abandoned, which is a continuation of application No. 07/549,889, Jul. 9, 1990, Pat. No. 5,228,137, which is a continuation-in-part of application No. 07/145,692, Jan. 15, 1988, abandoned, which is a continuation of application No. 06/792,424, Oct. 29, 1985, abandoned. This application Jun. 30, 1997, Appl. No. 885,141.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *15/00*

U.S. Cl. 709—302 **30 Claims**



1. A method for controlling simultaneous execution of one or more computer application programs in one or more host computer systems under control of a second computer system which may be remote from the one or more host computer systems, where said computer application programs may be dissimilar to each other, and said host computer systems may be dissimilar to each other, said host computer systems generating presentation information based on said application programs or on generic computer messages, or both, said method employing a programming framework for building customized gateways for said application programs;

said method comprising the steps of:

establishing a plurality of relevant selected parameters in said host computer presentation information;

said relevant selected parameters having a variable time of occurrence and context in said presentation information;

interpreting selected portions of said host computer systems' presentation information in said application program being executed; and

executing one or more of said application programs under the control of said second computer system through a customized gateway on the basis of said interpreted presentation information, said gateway utilizing an external object database to provide information for customizing said gateway.

6,041,366

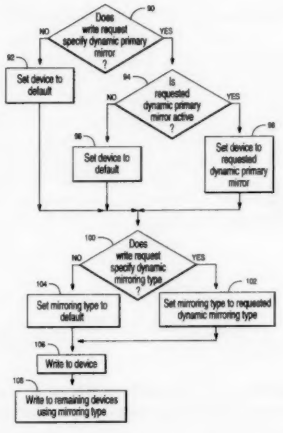
SYSTEM AND METHOD FOR DYNAMIC SPECIFICATION OF INPUT/OUTPUT ATTRIBUTES

John Maddalozzo, Jr.; Gerald Francis McBrearty, and Johnny Meng-Han Shieh, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1998, Appl. No. 19,566

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—5 **32 Claims**



1. A method for performing an I/O operation in a mirrored information handling system, comprising the steps of:

specifying a mirroring attribute;

if the specified mirroring attribute is available, performing the I/O operation according to the specified mirroring attribute; and

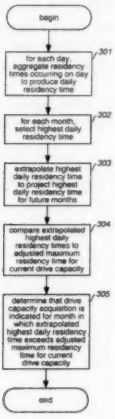
if the specified mirroring attribute is not available, performing the I/O operation according to default mirroring attributes.

6,041,367

FORECASTING RESOURCE REQUIREMENTS FOR A GROUP OF REMOVABLE MEDIA DEVICES BY MEASURING RESIDENCY TIME AND GENERATING MODEL

Richard L. Stuber, Colorado Springs, Colo., assignor to MCI Communications Corporation, Washington, D.C.

Filed Dec. 17, 1997, Appl. No. 992,384
Int. Cl.[7] G06F *13/10; G05B 13/04*
U.S. Cl. 710—18 **35 Claims**


begin
for each day, aggregate residency times occurring on day to produce daily residency time
301
for each month, select highest daily residency time
302
extrapolate highest daily residency time to project highest daily residency time for future months
303
compare extrapolated highest daily residency times to adjusted maximum residency time for current drive capacity
304
determine that drive capacity acquisition is indicated for month in which extrapolated highest daily residency time exceeds adjusted maximum residency time for current drive capacity
305
end

18. A method for forecasting resource requirements for removable media devices of a computer system, comprising the steps of:

collecting residency time data for the removable media devices of a computer system;

based upon the collected residency time data, calculating a maximum utilization of the removable media devices for a predetermined foregoing interval of time; and

based upon the calculated maximum utilization of the removable media devices for the predetermined foregoing interval of time, generating a model of future maximum residency time usable to forecast resource requirements for the removable media devices.

6,041,368

SYSTEM FOR OPERATING INPUT, PROCESSING AND OUTPUT UNITS IN PARALLEL AND USING DMA CIRCUIT FOR SUCCESSIVELY TRANSFERRING DATA THROUGH THE THREE UNITS VIA AN INTERNAL MEMORY

Fumio Nakatsuji, Kyoto; Toshinori Maeda, Neyagawa, and Hiroshi Kamiyama, Uji, all of Japan, assignors to Matsushita Electric Industrial, Co., Japan

Filed Apr. 2, 1998, Appl. No. 53,966
Claims priority, application Japan, Apr. 2, 1997, 9-083642
Int. Cl.[7] G06F *13/14*
U.S. Cl. 710—20 **14 Claims**

1. A data input-output device that performs operations on data input from a first device located outside thereof, and outputs the data to a second device located outside thereof comprising:

an input means for continually receiving data from the first device;

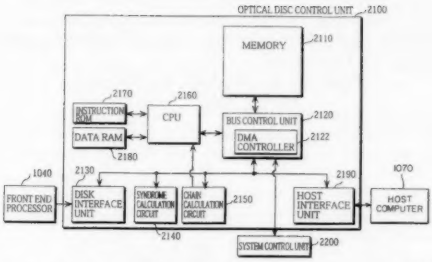
an operation means for performing an operation on the data;

an output means for outputting the data to the second device;

a memory for storing the data;

a memory bus for connecting the input means, the operation means, and the output means with the memory;

a first data transfer means for performing first DMA (direct memory access) transfer which transfers the data from the input means to the memory;



a second data transfer means for performing second DMA transfer which, when the first data transfer means has completed the first DMA transfer for a first predetermined amount of data, transfers the data that was stored by the first DMA transfer from an area in the memory to the operation means as the data for the operation;

a third data transfer means for performing third DMA transfer which, when the operation means has completed the operation for the first predetermined amount of data, transfers the data operated on by the operation means from the area in the memory to the output means; and

a data transfer control means for performing control so that at any given time, data transfer is performed by only one of the first data transfer means, the second data transfer means, and the third data transfer means, wherein

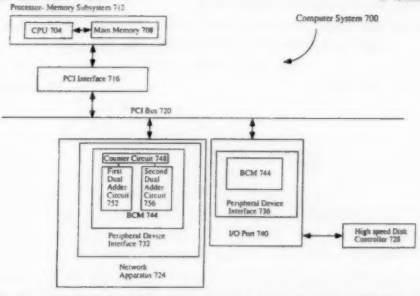
the input means, the operation means, and the output means operate independently in parallel.

6,041,369

REDUCING TWO VARIABLES IN ALTERNATE CLOCK CYCLES DURING DATA TRANSMISSION FOR MONITORING WHEN A DATA BURST IS CLOSE TO COMPLETION

John Watkins, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Division of application No. 08/673,057, Jul. 1, 1996, Pat. No. 5,832,302. This application Jun. 9, 1998, Appl. No. 93,595.
Int. Cl.[7] G06F *12/00*
U.S. Cl. 710—35 **6 Claims**



1. A method of indicating when a data burst including data phases, is about to be completed, said method comprising the step of:

initializing a first variable and a second variable;

during data phase transmission, reducing said first variable by a number of bytes transmitted in two of said data phases every odd numbered clock cycle after initializing said first variable;

during said data phase transmission, reducing said second variable by the number of bytes transmitted in two of said data phases every even numbered clock cycle after initializing said second variable,

using said first variable and said second variable to determine when the data burst is completed.

6,041,370

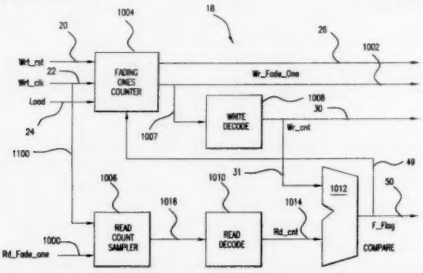
FIFO USING A FADING ONES COUNTER

Charles B. Guyt, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 8, 1997, Appl. No. 986,502

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—57 **21 Claims**



1. A method for determining a total number of data items stored in a FIFO, comprising the steps of:

encoding a current first count value by changing one of two adjacent bits within a bit field representing a previous first count value, with said adjacent bits both comprising a first value or said first value and a second value, and with all other bits in said bit field having said second value;

receiving a current second count value encoded by changing one of two adjacent bits within a bit field representing a previous second count value, with said adjacent bits both comprising said first value or said first value and said second value, and with all other bits in said bit field having said second value; and

comparing said current count values.

6,041,371

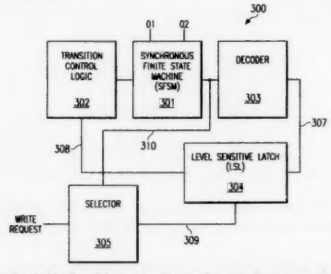
ASYNCHRONOUS INPUT/OUTPUT FOR INTEGRATED CIRCUITS THAT LATCHES EXTERNAL ASYNCHRONOUS SIGNAL IN FEEDBACK PATH OF STATE MACHINE

John D. Provence, Mesquite, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Provisional application No. 60/034,793, Dec. 19, 1996. This application Dec. 17, 1997, Appl. No. 992,698.

Int. Cl.[7] G06F *13/14*

U.S. Cl. 710—58 **16 Claims**



9. A method for latching an external asynchronous signal comprising the steps of:

providing a state machine having a first predefined state corresponding to an asynchronous latch state;

detecting when the state machine is in the first predefined state;

generating a asynchronous state signal when the first predefined state is detected;

inhibiting the state machine from changing from the first predefined state; and

in response to receiving the external asynchronous signal, feeding back the asynchronous state signal to the state machine to enable the state machine to change from the first predefined state.

6,041,372

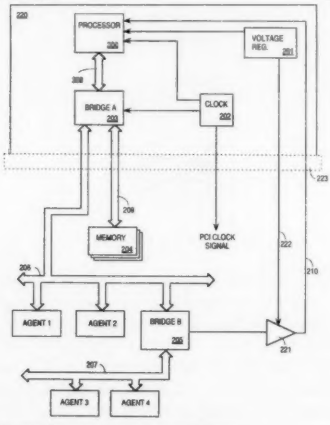
METHOD AND APPARATUS FOR PROVIDING A PROCESSOR MODULE FOR A COMPUTER SYSTEM

Frank P. Hart, Beaverton; Ravi Nagaraj, Hillsboro; James L. Noble, Portland, all of Oreg., and Neil W. Songer, Santa Clara, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1996, Appl. No. 774,515

Int. Cl.[7] G06F *13/10*; **H03K** *5/09*

U.S. Cl. 710—62 **14 Claims**



1. An electronic component comprising:

a circuit board;

an interface disposed on the circuit board to couple the circuit board to a peripheral subsystem via a socket;

a processor disposed on the circuit board to receive signals having a first voltage level;

a voltage regulator disposed on the circuit board to provide a processor voltage supply and a reference signal equal to the first voltage level;

a first signal line disposed on the circuit board and coupled to the interface to transmit to the peripheral subsystem the reference signal; and

a second signal line disposed on the circuit board and coupled to the interface to transmit from the peripheral subsystem to the circuit board a subsystem signal that has been converted to the first voltage level.

6,041,373

ENHANCED SCSI TRANSMITTER AND ADAPTER

Duc Pham, Cupertino, Calif., assignor to Diamond Multimedia Systems, Inc., Santa Clara, Calif.

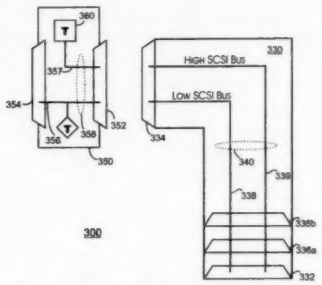
Filed May 23, 1997, Appl. No. 862,567

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—62 **16 Claims**

1. A kit having component parts capable of being assembled with a plurality of SCSI devices, including a SCSI host adapter card, to provide SCSI device interconnectability, wherein said SCSI host adapter card includes a first connector of a first width, said kit comprising:

(a) a cable, including a second connector adapted to be coupled to said first connector of said host adapter SCSI card, and a third connector of said first width; and



(b) a terminator-adapter, including a fourth connector adapted to be coupled to said third connector, a fifth connector of a second width, a first upper bus coupled to the fourth connector, a first lower bus coupled to the fourth connector and to the fifth connector, a first terminator coupled to the first upper bus, and a second terminator coupled to the first lower bus, said second terminator being a soft terminator that is automatically isolated from said first lower bus when a device is coupled to said fifth connector.

6,041,374

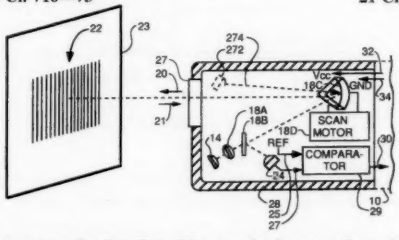
PCMCIA INTERFACE CARD FOR COUPLING INPUT DEVICES SUCH AS BARCODE SCANNING ENGINES TO PERSONAL DIGITAL ASSISTANTS AND PALMTOP COMPUTERS

Joel R. Postman, Santa Clara, Calif.; George B. Miller, Hingham, Mass., and Ronald C. Fish, Morgan Hill, Calif., assignors to PSC Inc.

Division of application No. 08/428,692, Apr. 25, 1995, Pat. No. 5,671,374, which is a continuation-in-part of application No. 08/236,630, Apr. 29, 1994, Pat. No. 5,664,231. This application Mar. 14, 1997, Appl. No. 815,006.

Int. Cl.[7] **G06K** *7/10;3/00;3/05*

U.S. Cl. 710—73 **21 Claims**



1. A process for decoding alphanumeric characters from electrical signals generated by an input device which generates output electrical signals encoding said alphanumeric characters and making said decoded alphanumeric characters available to a host computer, comprising:

storing data other than said alphanumeric characters in nonvolatile expansion memory on a PCMCIA card, hereafter sometimes referred to as a PC card, coupled to said host computer by a PCMCIA interface, said data being data needed by one or more application processes in execution on said host computer;

receiving at a PCMCIA card coupled to said host computer said output signals generated by said input device which encode said alphanumeric characters

decoding said output electrical signals into one or more alphanumeric characters on said PCMCIA card and storing the decoded alphanumeric character in a memory location on said PCMCIA card which is mapped into the Input/Output address space of zone **3** of the memory map of said PCMCIA card;

retrieving said decoded alphanumeric characters using I/O cycles of said host computer and a PCMCIA bus coupling said PCMCIA card to said host computer while allowing said data stored in said nonvolatile memory on said PCMCIA card to also be accessed by said host computer via memory cycles and said PCMCIA bus without having to reboot the host computer.

6,041,375

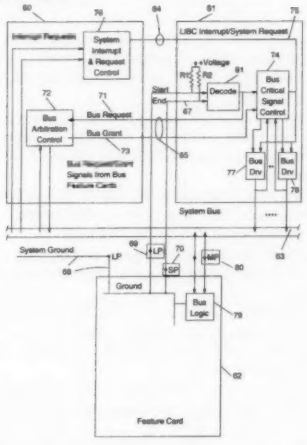
METHOD AND SYSTEM FOR ENABLING NONDISRUPTIVE LIVE INSERTION AND REMOVAL OF FEATURE CARDS IN A COMPUTER SYSTEM

Brian Mitchell Bass, Apex; James Allison Hubbard; Price Ward Oman, both of Raleigh, and Frank J. Pita, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 08/826,789, Apr. 7, 1997, Pat. No. 5,964,855. This application May 28, 1999, Appl. No. 321,688.

Int. Cl.[7] **G06F** *13/00*

U.S. Cl. 710—103 **22 Claims**



1. A method of live-inserting pluggable units into an information processing system, said system having a processor, memory and at least one slot for accepting a pluggable unit, said processor, memory and slot being directly connected through a common bus, circuitry for detecting the insertion of said pluggable unit into said slot and a bus controller for controlling the operation of said bus, the method comprising the steps of:

identifying at least one down-level active control signal being transferred over said bus that, when asserted, produces a state on said bus in which no bus operations are being performed;

determining a start time and an end time associated with the insertion of said pluggable unit into said slot;

ceasing bus activity at least in a time interval between said start time and said end time; and

driving said down-level active control signal of said system bus to a low level at least in a time interval between said start time and said end time.

6,041,376

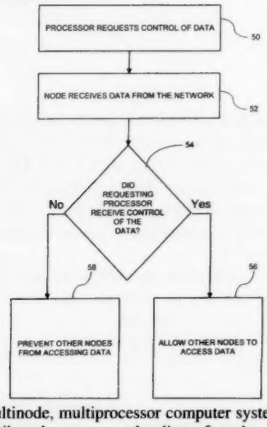
DISTRIBUTED SHARED MEMORY SYSTEM HAVING A FIRST NODE THAT PREVENTS OTHER NODES FROM ACCESSING REQUESTED DATA UNTIL A PROCESSOR ON THE FIRST NODE CONTROLS THE REQUESTED DATA

Bruce Michael Gilbert, Beaverton; Robert T. Joersz, Portland; Thomas D. Lovett, Portland, and Robert J. Safranek, Portland, all of Oreg., assignors to Sequent Computer Systems, Inc., Beaverton, Oreg.

Filed Apr. 24, 1997, Appl. No. 850,736

Int. Cl.[7] G06F *13/364*

U.S. Cl. 710—108 **23 Claims**



23. In a multinode, multiprocessor computer system with shared memory distributed across a plurality of nodes, a method of ensuring a requesting processor within a node obtains data that is requested, comprising:

using a processor in a first node, requesting access to data;

within the first node, issuing a response to the requesting processor for the requesting processor to retry its request for data at a later time;

from the first node, requesting the data be delivered to the first node from one of the other nodes in the system;

receiving the requested data in the first node;

once the requested data is received, issuing retry requests to other nodes that attempt to access the requested data on the first node;

using the requesting processor in the first node, retrying the request for access to the requested data;

within the first node, delivering the requested data to the requesting processor; and

after the processor has control of the requested data, allowing other nodes to access the requested data from the first node.

6,041,377

METHOD AND APPARATUS FOR DISTRIBUTING INTERRUPTS IN A SCALABLE SYMMETRIC MULTIPROCESSOR SYSTEM WITHOUT CHANGING THE BUS WIDTH OR BUS PROTOCOL

Dale J. Mayer, Houston; Sompong Paul Olarig; William F. Whiteman, both of Cypress, and David F. Heinrich, Tomball, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

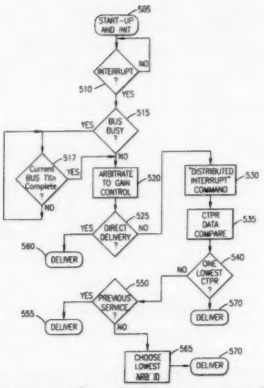
Continuation of application No. 08/699,912, Aug. 20, 1996. This application Feb. 2, 1999, Appl. No. 243,235.

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—113 **13 Claims**

1. A method for supporting multiple distributed interrupt controllers, designated as bus agents, in a symmetric multiprocessing system, said method comprising the steps of:

assigning a unique identification number to each bus agent;



receiving bus requests from the bus agents over four data lines in groups of four; and

granting bus ownership to a selected one of the requesting bus agents.

6,041,378

INTEGRATED CIRCUIT DEVICE AND METHOD OF COMMUNICATION THEREWITH

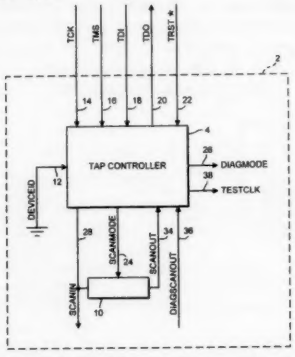
Robert Warren, Thornbury, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Almondsbury Bristol, United Kingdom

Filed Oct. 29, 1997, Appl. No. 960,187

Claims priority, application United Kingdom, Oct. 31, 1996, 9622685

Int. Cl.[7] G06F *11/00*

U.S. Cl. 710—127 **28 Claims**



1. A single chip integrated circuit device comprising:

an on-chip target processor;

an on-chip bus system having a first bit width and providing a parallel path between the target processor and a local memory said bus system having address lines, data lines and at least one read/write control line;

a message converter connected to the bus system by a first set of pins equal in number to the bit width of the bus system, the message converter having a second set of pins which are less in number than in the first set of pins;

a communication path connected to the second set of pins for communicating reduced pin data across the chip boundary;

wherein the message converter comprises:

control circuitry connected to the on-chip bus system;

reduced pin data receiving circuitry for receiving messages supplied from off chip via the communication path, decoding a message identifier of each message and causing the control circuitry to operate selectively the address lines,

data lines and read/write control line of the bus system in accordance with the message identifier to effect a memory access to the local memory without utilising the on-chip target processor; and

data transmit circuitry for formulating messages from information received from the bus system, allocating a message identifier to each message and transmitting messages off-chip in the form of reduced pin data.

6,041,379

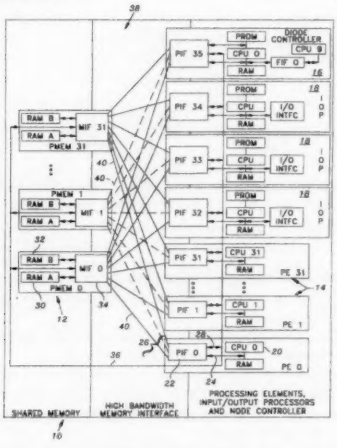
PROCESSOR INTERFACE FOR A DISTRIBUTED MEMORY ADDRESSING SYSTEM

Richard Alan Sher, Huntington, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Oct. 4, 1996, Appl. No. 726,117

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—129 **6 Claims**



1. An interface for interfacing a plurality of processors to each other and to a global memory in a non-blocking manner comprising:

a) said global memory including a plurality of memory elements;

b) said plurality of processors;

c) a node control bus;

d) said plurality of processor interfaces each connected to one of said plurality of processors and to said node control bus; and

e) a plurality of serial fixed-speed interconnections between said plurality of processor interfaces and said plurality of memory elements, one interconnection extending between each of said plurality of processor interfaces and each said memory element, said plurality of fixed-speed interconnections permitting the maximum speed of operation regardless of the serial interconnection selected;

f) said each of said plurality of processor interfaces providing a non-blocking bi-directional memory access between one of said plurality of processors and said global memory.

6,041,380

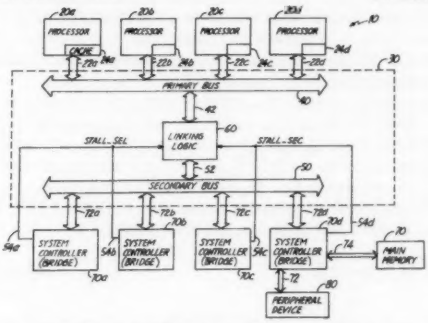
METHOD FOR INCREASING THE NUMBER OF DEVICES CAPABLE OF BEING OPERABLY CONNECTED TO A HOST BUS

Paul A. LaBerge, Shoreview, Minn., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Jan. 21, 1998, Appl. No. 10,084

Int. Cl.[7] G06F *13/40;13/38*

U.S. Cl. 710—129 **13 Claims**



1. A method for operating a host bus, wherein the host bus comprises a first bus and a physically distinct second bus, and wherein at least one requesting agent is operably connected to the first bus and wherein at least one target agent is operably connected to the second bus, comprising:

(a) clocking the first bus at a first frequency;

(b) clocking the second bus at the first frequency; and

(c) providing signals to the second bus one and one half clock cycles after the signals have been provided to the first bus by the at least one requesting agent; and

(d) providing signals to the first bus one and one half clock cycles after the signals have been provided to the second bus by the at least one target agent.

6,041,381

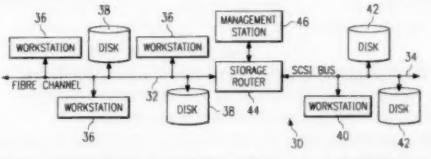
FIBRE CHANNEL TO SCSI ADDRESSING METHOD AND SYSTEM

Geoffrey B. Hoese, Austin, Tex., assignor to Crossroads Systems, Inc., Austin, Tex.

Filed Feb. 5, 1998, Appl. No. 19,448

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—129 **13 Claims**



1. A computer implemented Fibre Channel to SCSI addressing method, comprising:

maintaining a first table of Fibre Channel to SCSI bus routing information;

maintaining a second table of SCSI bus to Fibre Channel routing information;

receiving a cross bus transfer, wherein the cross-bus transfer is initiated by a device on a Fibre Channel or a SCSI bus, respectively, and further wherein the cross bus transfer is intended to be delivered to a target device associated with the SCSI bus or the Fibre Channel, respectively, and further wherein the cross bus transfer contains addressing information that specifies a target for the cross bus transfer; and

translating the addressing information by comparing the addressing information to either the first table or second table, respectively, such that the cross bus transfer can be delivered to the target.

6,041,382

PRINTING APPARATUS AND A METHOD THEREFOR, AND INFORMATION PROCESSING APPARATUS AND A METHOD THEREFOR

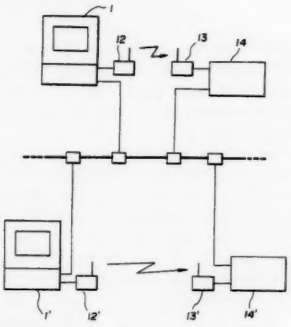
Yoshiaki Hirano, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of application No. 08/856,000, May 14, 1997, Pat. No. 5,867,720, which is a continuation of application No. 08/755,132, Nov. 22, 1996, abandoned, which is a continuation of application No. 08/163,757, Dec. 9, 1993, abandoned. This application Dec. 10, 1998, Appl. No. 208,403.

Claims priority, application Japan, Dec. 14, 1992, 4-332751; Jun. 25, 1993, 5-177619; Nov. 18, 1993, 5-289357

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—131 **14 Claims**



1. Information outputting apparatus comprising:

output means for outputting information to an output apparatus using a wire system or a radio system;

determining means for determining whether information to be transmitted to said output apparatus is outputted using the wire system or the radio system; and

control means for controlling said output means by switching between the wire system and the radio system in accordance with a result of the determination.

6,041,383

ESTABLISHING CONTROL OF LOCK TOKEN FOR SHARED OBJECTS UPON APPROVAL MESSAGES FROM ALL OTHER PROCESSES

Jason Jeffords, Dover; Todd A. Crowley, Windham, and Roger Dev, Durham, all of N.H., assignors to Cabletron Systems, Inc., Rochester, N.H.

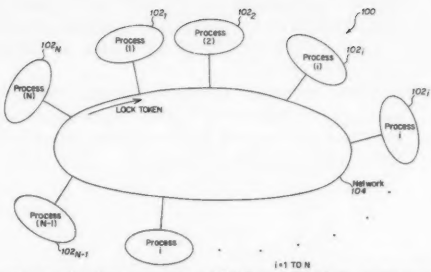
Filed Jul. 22, 1996, Appl. No. 681,040

Int. Cl.[7] G06F *13/37*

U.S. Cl. 710—200 **17 Claims**

1. A computer-implemented method of synchronizing a plurality of processes in a distributed system, the method comprising:

when a first process requires access to a shared object in an object-oriented programming environment, the first process establishing control of a transmittable lock token associated with the shared object and transmitting a message to each process of the plurality of processes indicating that the first process controls the lock token,



wherein the first process establishes control in response to receiving an object control approval message from each other process in the plurality of processes.

6,041,384

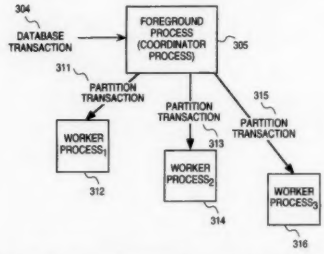
METHOD FOR MANAGING SHARED RESOURCES IN A MULTIPROCESSING COMPUTER SYSTEM

William H. Waddington, Foster City; Leng Leng Tan, Sunnyvale, and Patricia Grewell, San Mateo, all of Calif., assignors to Oracle Corporation, Redwoood Shores, Calif.

Filed May 30, 1997, Appl. No. 866,200

Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—200 **23 Claims**



1. A method for managing shared resources in a multiprocessing computer system, said method comprising the computer-implemented steps of:

a coordinator process identifying resources to be operated upon by a plurality of worker processes;

the coordinator process acquiring locks from a lock manager to lock the resources on behalf of the plurality of worker processes such that the coordinator process is indicated to be a holder of the locks; and

the plurality of worker processes operating on the resources locked by the coordinator process without the plurality of worker processes acquiring locks to the resources.

6,041,385

METHOD AND APPARATUS FOR PROTECTING DATA USING LOCK VALUES IN A COMPUTER SYSTEM

Mark S. Shipman, Hillsboro; Orville H. Christeson, and Timothy E. W. Labatte, both of Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of application No. 08/623,930, Mar. 28, 1996, Pat. No. 5,852,736. This application Oct. 14, 1998, Appl. No. 172,777.

This patent is subject to a terminal disclaimer.

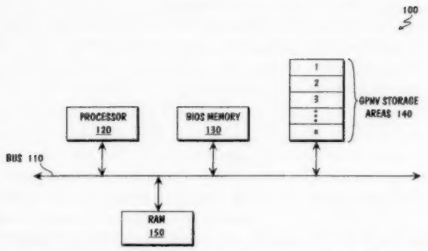
Int. Cl.[7] G06F *13/00*

U.S. Cl. 710—200 **37 Claims**

37. A computer system comprising:

a processor;

a first hardware-readable medium having stored therein a first plurality of instructions, the first plurality of instructions



including instructions which, when executed by the processor, cause the processor to perform the steps of:

(a) indicating that a nonvolatile storage area does not support locked accesses;

(b) receiving a request to perform a locked access write to the nonvolatile storage area;

(c) checking whether a lock value corresponding to the request is valid; and

(d) writing data corresponding to the request to the nonvolatile storage area if the lock value is valid; and,

a second hardware-readable medium having stored therein a second plurality of instructions, the second plurality of instructions including instructions which, when executed by the processor, cause the processor to perform the steps of:

(a) making a read request to read the nonvolatile storage area; and

(b) making a request to perform a locked access write to the nonvolatile storage area accompanied by a valid lock value, after the processor indicates that the nonvolatile storage area does not support locked accesses.

6,041,386

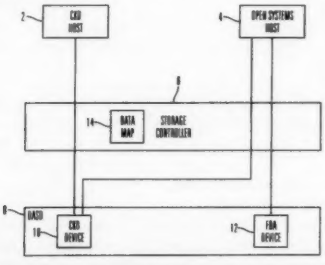
DATA SHARING BETWEEN SYSTEM USING DIFFERENT DATA STORAGE FORMATS

Keith Anthony Bello, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1998, Appl. No. 21,498

Int. Cl.[7] G06F *12/00*

U.S. Cl. 711—4 **28 Claims**



1. A method for extracting data from a device storing data in a first format, wherein the first format is comprised of a plurality of tracks, wherein each track has at least one data area, and wherein each data area is comprised of at least one addressable block of data, comprising the steps of:

(a) receiving a request from a host system for an address of a block of data in a second data format;

(b) determining a byte displacement value for the requested address;

(c) locating a data area in a track in the device having a byte displacement value less than the byte displacement value for the requested address;

(d) determining a byte location offset by subtracting the byte displacement value for the located data area from the byte displacement value for the requested address;

(e) determining a location in the located data area of a block of data at the byte location offset; and

(f) providing the host system with the located block of data.

6,041,387

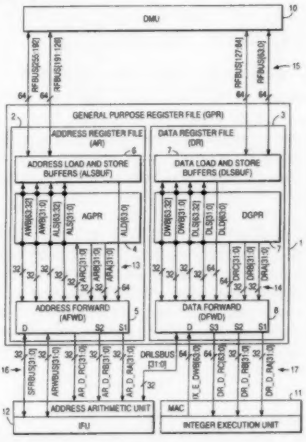
APPARATUS FOR READ/WRITE-ACCESS TO REGISTERS HAVING REGISTER FILE ARCHITECTURE IN A CENTRAL PROCESSING UNIT

Rod G. Fleck, Mountain View, and Roger D. Arnold, Sunnyvale, both of Calif., assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 12, 1997, Appl. No. 928,428

Int. Cl.[7] G06F *12/00*

U.S. Cl. 711—5 **11 Claims**



1. A data processing unit comprising:

a set of data registers and a set of address registers, each register having a width of n bits, and each set of data and address registers comprising even and odd data and address registers, respectively,

first address load and store buffers associated with said even address registers and second address load and store buffers associated with said odd address registers,

first data load and store buffers associated with said even data registers and second data load and store buffers associated with said odd data registers,

a bus having a plurality of bus lines comprising a width of 4n bits being connected to said first and second store buffers,

a data memory unit being connected to said bus, wherein 2n-bit data words and 2n-bit address words can be transferred from or to said memory to or from one of said even, one of said odd data registers, one of said even, and one of said odd address registers in parallel;

wherein each register has a plurality of ports and at least one of said bus lines is coupled in parallel to selected registers of said set of data registers;

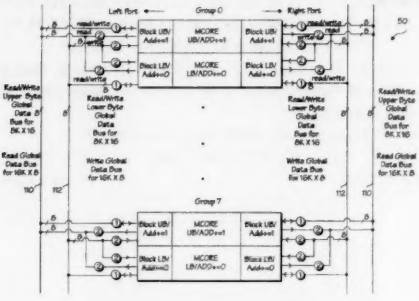
wherein each register comprises a memory cell having an input terminal and an output terminal, a plurality of tri-state buffers with inputs and outputs, said output terminal being connected to the inputs of said plurality of tri-state buffers;

wherein each register further comprises a plurality of transfer gates, said input terminal of said memory cell being connected to the outputs of said plurality of transfer gate.

6,041,388
CIRCUIT AND METHOD FOR CONTROLLING MEMORY DEPTH

Sudhaker Reddy Anumula, Starkville, Miss., and Ping Wu, Austin, Tex., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Provisional application No. 60/032,816, Dec. 11, 1996. This application Feb. 19, 1997, Appl. No. 804,025.
Int. Cl.[7] G06F *13/00*
U.S. Cl. 711—100 **19 Claims**



1. A circuit for controlling a memory depth, comprising:

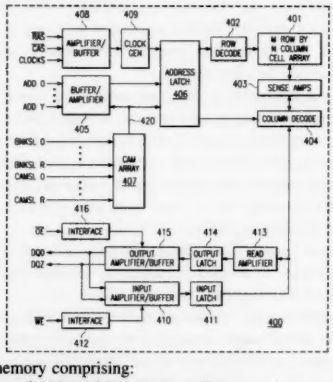
a memory array having (i) a fixed physical depth and (ii) a variable array depth selected from at least two members of the group consisting of xN bits, x(N+1) bits, 2x(N+1) bits, and (2x)N bits, where x and N are integers; and

control logic configured to (a) control read and/or write operations in said memory array and (b) recognize a first one of said array depths in response to one or more read and/or write control signal(s) and a first address comprising m bits, and a second one of said array depths in response to said one or more read and/or write control signal(s) and a second address comprising (m+1) bits, wherein (m+1)<2N and m is an integer.

6,041,389
MEMORY ARCHITECTURE USING CONTENT ADDRESSABLE MEMORY, AND SYSTEMS AND METHODS USING THE SAME

G. R. Mohan Rao, Dallas, Tex., assignor to E Cirrus Logic, Inc.

Filed Nov. 16, 1995, Appl. No. 559,379
Int. Cl.[7] G06F *12/00*
U.S. Cl. 711—108 **23 Claims**



1. A memory comprising:

an array of addressable memory cells;

addressing circuitry for accessing selected ones of said memory cells in response to received location address bits said address circuitry including a row decoder for selecting a row of said memory cells of said array in response to a row address and a column decoder for accessing selected cells along a said selected row in response to a column address;

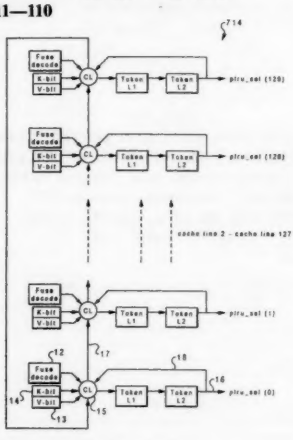
an address buffer for selectively passing said received address bits to said addressing circuitry; and

a content addressable memory cell including latching circuitry for storing a select bit associated with the array and an exclusive-NOR gate for comparing a received select bit with the stored select bit associated with said array, said exclusive-NOR gate having an output coupled to an enable line coupled to said address buffer for selectively enabling presentation of said address bits through said address buffer to said addressing circuitry for accessing addressed ones of said memory cells, said content addressable memory cell having a first input for receiving a signal to enable writing said stored select bit into said latching circuitry, and having one or more content inputs for receiving a bit to be stored.

6,041,390
TOKEN MECHANISM FOR CACHE-LINE REPLACEMENT WITHIN A CACHE MEMORY HAVING REDUNDANT CACHE LINES

Peichun Peter Liu; Rajinder Paul Singh, and Shih-Hsiung Steve Tung, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1996, Appl. No. 773,545
Int. Cl.[7] G06F *12/12*
U.S. Cl. 711—110 **14 Claims**



1. A cache memory, comprising:

a plurality of cache lines;

a plurality of token registers connected in a loop configuration, wherein each of said plurality of token registers is associated with a respective one of said plurality of cache lines;

a plurality of K-bit memory cells, wherein each of said plurality of K-bit memory cells is associated with a respective one of said plurality of cache lines;

a plurality of V-bit memory cells, wherein each of said plurality of V-bit memory cells is associated with a respective one of said plurality of cache lines; and

a token for indicating a candidate cache line for cache-line replacement, wherein said token resides within one of said plurality of token registers having its associated V-bit memory cell set to a first state, wherein said token moves to another one of said plurality of token registers when said associated V-bit memory cell changes to a second state, wherein said token skips a token register associated with a cache line when its associated K-bit memory cell is in a first state.

6,041,391

STORAGE DEVICE AND METHOD FOR DATA SHARING

Motohiro Kanda, Yokohama; Akira Yamamoto, Sagamihara; Toshio Nakano, Chigasaki, and Minoru Yoshida, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

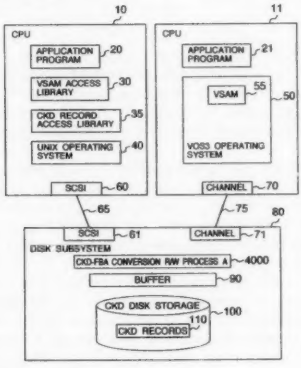
Continuation of application No. 09/256,472, Feb. 23, 1999, Pat. No. 5,983,317, which is a continuation of application No. 08/774,447, Dec. 30, 1996. This application May 21, 1999, Appl. No. 315,819.

Claims priority, application Japan, Jan. 19, 1996, 8-007136

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **G06F** *13/14*

U.S. Cl. 711—112 **4 Claims**



1. A computer system, comprising:

a first computer with a first channel interface;

a second computer with a first SCSI interface; and

a disk subsystem, storing count-key-data format data from the first computer in said disk subsystem, said disk subsystem including a second channel interface which is connected to the first channel interface of said first computer and a second SCSI interface which is connected to the first SCSI interface of said second computer,

wherein said first computer prepares dataset managing information which includes a plurality of data set location addresses corresponding to dataset names of the count-key-data format data, wherein each dataset location address is in a count-key-data format, and

wherein in said second computer, responsive to a disk access request from an application program identifying a dataset name, said second computer generates a block address from a dataset location address based on the dataset managing information, wherein the dataset location address corresponds to the dataset name identified by the disk access request, and sends the block address through the first SCSI interface to said disk subsystem.

6,041,392

DISK DRIVE DEVICE AND METHOD FOR CONTROLLING THE SAME

Atsushi Kanamaru, Sagamihara; Toshio Kakihara, Fujisawa; Yuhji Kigami, Yamato, and Takahiro Saitoh, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1998, Appl. No. 49,680

Claims priority, application Japan, Mar. 27, 1997, 9-074949

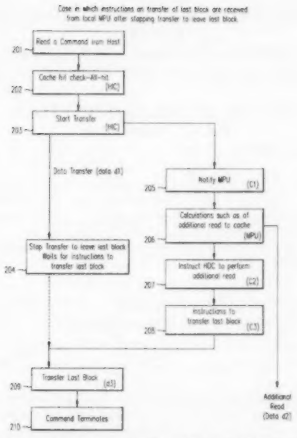
Int. Cl.[7] **G06F** *12/08*

U.S. Cl. 711—113 **5 Claims**

1. A method of controlling a read operation in a disk drive, comprising the steps of:

(a) receiving a read command;

(b) determining whether all data blocks requested by said read command are stored in a cache memory;


Zone in which instructions on transfer of last block are received from local MPU after stopping transfer to leave last block
Read a Command from Host
201
Cache hit check--All--hit (MC)
202
Start Transfer (MC)
203
Data Transfer (data d1)
Notify MPU (C1)
205
Calculations such as of additional read to cache (MPU)
206
Stop Transfer to leave last block Waits for instructions to transfer last block
204
Instruct HDC to perform additional read (C2)
207
Instructions to transfer last block (C3)
208
Transfer Last Block (d3)
209
Command Terminates
210
Additional Read (Data d2)

(c) if it is determined that all of said data blocks are stored in said cache memory, notifying a local microprocessor of the receipt of said read command and the all-hit status;

(d) transferring all of said data blocks except for at least a last one of said data blocks from said cache memory to an external host without any intervention from said local microprocessor; and

(e) transferring said at least said last one of said data blocks from said cache memory to said external host upon an instruction from said local microprocessor.

6,041,393

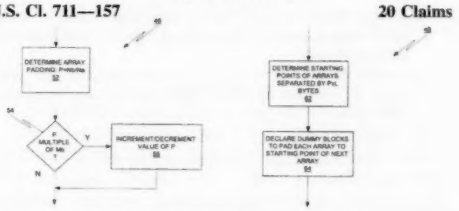
ARRAY PADDING FOR HIGHER MEMORY THROUGHPUT IN THE PRESENCE OF DIRTY MISSES

Wei Hsu, Cupertino, Calif., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Aug. 23, 1996, Appl. No. 704,218

Int. Cl.[7] **G06F** *12/06*

U.S. Cl. 711—157 **20 Claims**



1. A method of increasing memory throughput in a computer system which includes a CPU with a cache and an interleaved memory system, the method comprising:

determining a number of memory banks (Nb) in the memory system;

identifying a number of arrays (Na) in a loop in a program to be executed on the CPU;

determining a cache line size (Ls) of the cache;

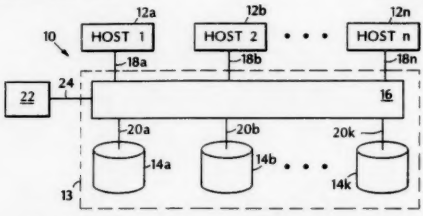
determining a spacing among a number of arrays to be stored in the memory system according to the number of memory banks (Nb), the number of arrays (Na) to be accessed in the loop, and the cache line size (Ls); and

padding the arrays by the array spacing.

6,041,394
DISK ARRAY WRITE PROTECTION AT THE SUB-UNIT LEVEL

Kenneth A. Halligan, Leominster, and Erez Ofer, Brookline, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Sep. 24, 1997, Appl. No. 935,458
Int. Cl.[7] G06F *13/14*
U.S. Cl. 711—166 **19 Claims**



11. In a system having a plurality of host computers and at least one mass storage device having a controller for accessing a plurality of logical volumes, at least one of said logical volumes being able to be written to by at least two of said hosts at different controller ports, a method for changing the write protect status of a said logical volume comprising the steps of

obtaining control of a write protect lock, in response to a host request, from a first host, for a change in write Protect status for at least one selected logical volume,

writing, in response to said first host, a write protect message to a logical volume memory location associate with each logical volume to be affected,

setting a flag message in a message memory location indicating a change in said logical volume memory location,

polling the message memory location for set flag messages,

writing, in response to a set flag message, in a local memory associated with the controller port associated with the requesting host, a status of at least all logical volumes accessible from said port,

preventing, at the controller, a host from writing to a protected logical volume as identified by data in a said controller's local memory, and

further wherein said request affects one of only a specified logical volume and all logical volumes which are accessible from the affected port, and

wherein said request includes one of the following modes:

a) no operation to be performed,

b) a write enable for all logical volumes seen from the port,

c) a write disable to effect all logical volume(s) seen from the port,

d) a write enable for all logical volumes seen from the port and a write disable for these logical volumes seen from any other port, and

e) a write disable for all logical volumes seen from the port and a write enable for these logical volumes seen from any other port.

6,041,395
SYSTEM AND METHOD FOR CHANGING PARTITION MAPPINGS TO LOGICAL DRIVES IN A COMPUTER MEMORY

Alan E. Beelitz, Austin, Tex., assignor to Dell USA, L.P., Round Rock, Tex.

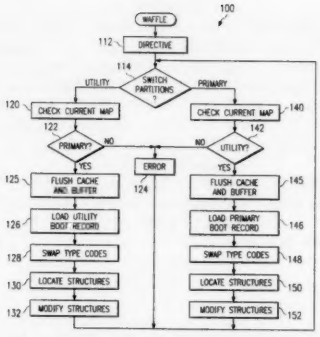
Filed Dec. 3, 1997, Appl. No. 984,386
Int. Cl.[7] G06F *12/00*
U.S. Cl. 711—173 **12 Claims**

1. A computer comprising:

at least one processor for running operating code;

at least one storage accessible by the processor, the storage being separated into at least two partitions;

the operating code for using a logical reference to the storage and including a table for mapping the logical reference to a first partition of the at least two partitions; and



a routine for dynamically switching, in response to a directive provided by a manufacturing process, the logical reference to a second partition of the at least two partitions by altering the table;

wherein the first and second partitions each include a type code and wherein the routine swaps the type of each partition when it changes the logical reference, so that the partition to which the logical reference is made has a type that is visible to the operating code and the other partition has a type that is not visible to the operating code,

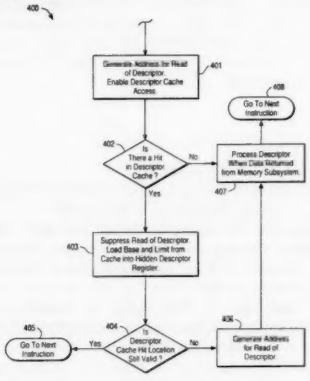
wherein the first and second partitions each include a status code and wherein the routine also swaps the status of each partition when it changes the logical reference, so that the partition to which the logical reference is made has an active status and the other partition does not have an active status, and

wherein after the routine alters the table, the processor may continue running the operating code without requiring the computer to reboot and when the operating code uses the logical reference to the storage, the operating code is mapped to the second partition.

6,041,396
SEGMENT DESCRIPTOR CACHE ADDRESSED BY PART OF THE PHYSICAL ADDRESS OF THE DESIRED DESCRIPTOR

Larry Widigen, Salinas, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 14, 1996, Appl. No. 615,912
Int. Cl.[7] G06F *12/08*
U.S. Cl. 711—206 **24 Claims**



1. In a microprocessor memory management system, a segment of a memory being specified by a segment descriptor, the segment descriptor being stored at a first physical address in a descriptor table held in the memory, a method of loading the segment

descriptor into a segment descriptor register in response to a segment selector load instruction specifying a selector, the method comprising:

forming a first part of the first physical address;

searching for the segment descriptor in a part of a descriptor cache, the descriptor cache including a plurality of entries, the part of the descriptor cache including one or more of the entries and being addressed by the first part of the first physical address; and

after the step of searching fails to find the segment descriptor in the descriptor cache, loading a second part of the first physical address into a first entry of a physical address cache, the physical address cache including a plurality of entries.

6,041,397

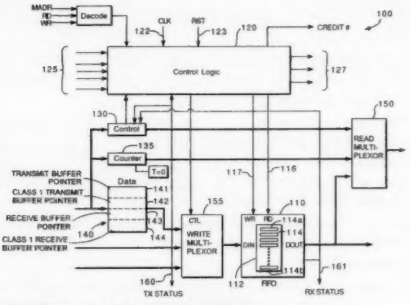
EFFICIENT TRANSMISSION BUFFER MANAGEMENT SYSTEM

Wayne Rickard, Oceanside; Peter Fiacco, Yorba Linda, and Vi Chau, Laguna Niguel, all of Calif., assignors to Emulex Corporation, Costa Mesa, Calif.

Division of application No. 08/484,592, Jun. 7, 1995, Pat. No. 5,860,149. This application Jan. 12, 1999, Appl. No. 229,464.

Int. Cl.[7] G06F *12/00*

U.S. Cl. 711—209 **4 Claims**



1. A buffer control device comprising:

(a) first and second transmit registers for transmitting data;

(b) first and second receive registers for receiving said data from said transmit registers;

(c) a first-in-first-out (FIFO) memory for storing a list of buffer pointers, said buffer pointers being assigned from a top of the FIFO memory and returned to a bottom of the FIFO memory;

(d) control logic coupled to said FIFO memory, said control logic assigning buffer pointers from said transmit registers, and moving buffer pointers from the transmit registers to the bottom of the first-in-first-out memory; and

(e) means for asserting a signal coupled with said control logic, said means asserting a signal if a buffer pointer is returned to the first transmit register or the first receive register but not if the buffer pointer is returned to the second transmit register or the second receive register.

6,041,398

MASSIVELY PARALLEL MULTIPLE-FOLDED CLUSTERED PROCESSOR MESH ARRAY

Gerald George Pechanek, Endwell; Stamatis Vassiliadis, Vestal, and Jose Guadalupe Delgado-Frias, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1992, Appl. No. 904,916

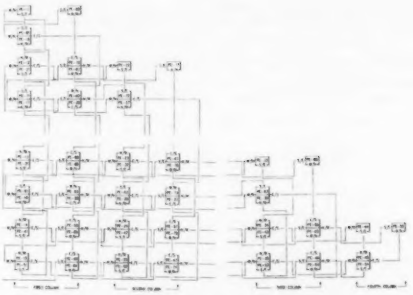
This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *15/80*

U.S. Cl. 712—11 **7 Claims**

1. A triple-folded array parallel computing system comprising:

a plurality of processing elements (PEs) each coupled to a plurality of others of said PEs such that the plurality of PEs is



logically equivalent to at least a square two dimensional array configuration of PEs having an equal number of PE's as said computing system, for executing at least algorithms executable on the two dimensional array configuration;

each of the PEs comprising: a plurality of I/O ports for sending and receiving instructions and data to and from coupled ones of the PEs, means for executing instructions, and means for storing instructions and data;

a portion of the PEs paired by a first diagonal fold in said square array into a plurality of symmetric PEs forming a first fold mesh, the symmetric PEs each comprising a pair of a first PE and a second PE sharing each of said I/O ports as shared ports for sending and receiving instructions and data such that each of the pair of PEs communicates with PEs originally coupled to the first PE and with PEs originally coupled to the second PE of said pair of PEs, said pair of PEs including PE_{ij} and PE_{ji}, where i and j are column and row designators of a PE in said logically equivalent square two dimensional array configuration, and where i and j are positive non-equal integers;

a remaining portion of the PEs configured into a plurality of diagonal PEs, the diagonal PEs each coupled to two symmetric PEs each via one of said shared ports; and

said plurality of symmetric PEs and diagonal PEs grouped by consecutive second and third folds in said first fold mesh, into a plurality of clusters each comprising a plurality of PEs, a portion of the clusters each comprising four symmetric PEs and a remaining portion of the clusters each comprising two diagonal PEs, the plurality of clusters each comprising an additional coupling between a pair of previously uncoupled PEs.

6,041,399

VLIW SYSTEM WITH PREDICATED INSTRUCTION EXECUTION FOR INDIVIDUAL INSTRUCTION FIELDS

Koichi Terada, Yokohama; Keiji Kojima, Sagamihara; Yoshifumi Fujikawa, Hiroshima-ken; Tohru Nojiri, Tokyo, and Kiyokazu Nishioka, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1997, Appl. No. 884,667

Claims priority, application Japan, Jul. 11, 1996, 8-182141

Int. Cl.[7] G06F *9/38*

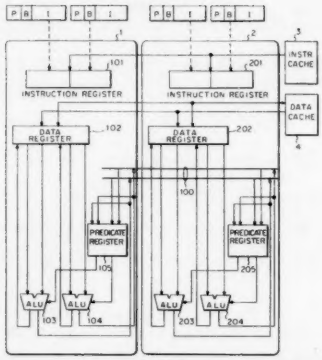
U.S. Cl. 712—24 **13 Claims**

1. A processing apparatus executing a plurality of instruction fields in one instruction word in parallel, comprising:

a plurality of registers provided corresponding to a plurality of instruction field groups, each instruction field group including:

at least one instruction field,

a circuit for storing values to a plurality of registers based on the result of an operation, and



an operation circuit for selecting whether an operation should be executed based on an evaluation of the values stored in said plurality of registers, said operation circuit having a register which is independent of the other registers in the other operation circuits, each of said independent registers being updated with a result of the evaluation.

6,041,400

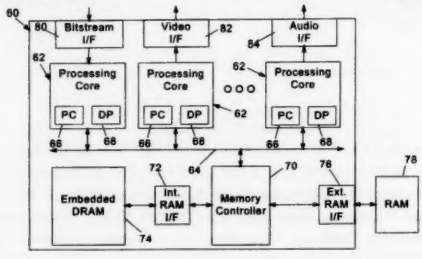
DISTRIBUTED EXTENSIBLE PROCESSING ARCHITECTURE FOR DIGITAL SIGNAL PROCESSING APPLICATIONS

Taner Ozcelik, Palo Alto; Shirish Gadre, and Yew-Koon Tan, both of San Jose, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Oct. 26, 1998, Appl. No. 179,147

Int. Cl.[7] G06F *19/00*

U.S. Cl. 712—35 **40 Claims**



1. An integrated circuit device circuit arrangement for processing multimedia data, the circuit arrangement comprising:

(a) a communications bus; and

(b) a plurality of processing cores coupled to one another over the communications bus, each processing core including:

(1) a hardwired datapath configured to perform a predetermined digital signal processing (DSP) operation; and

(2) a programmable controller coupled to the hardwired datapath, the programmable controller configured to execute a local computer program to control the operation of the hardwired datapath to process data received by the processing core over the communications bus.

6,041,401

COMPUTER SYSTEM THAT PLACES A CACHE MEMORY INTO LOW POWER MODE IN RESPONSE TO SPECIAL BUS CYCLES EXECUTED ON THE BUS

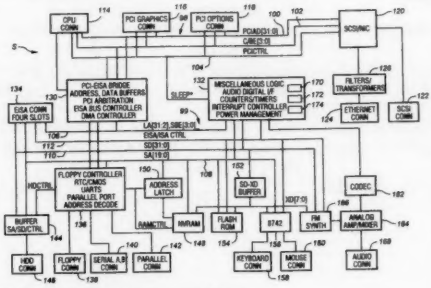
Jens K. Ramsey, Houston; Jeffrey C. Stevens, Spring; Michael E. Tubbs, Montgomery, and Charles J. Stancil, Tomball, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of application No. 08/703,927, Aug. 28, 1996, Pat. No. 5,813,022, which is a continuation of application No. 08/323,110, Oct. 14, 1994, abandoned. This application Feb. 27, 1998, Appl. No. 32,429.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G06F *12/00*

U.S. Cl. 712—43 **5 Claims**



1. A computer system, comprising:

a bus;

a main memory array coupled to the bus;

a microprocessor coupled to the bus; and

a disk drive coupled to the microprocessor, the disk drive adapted to be spun down to save power:

wherein the microprocessor generates a special cycle responsive to the disk drive being spun down;

a circuit including:

a cache memory device coupled to the bus, the cache memory device having a chip select input;

a special cycle decoder coupled to the bus for asserting a first signal if the special cycle is detected; and

a chip selector coupled to the chip select input of the cache memory device, the chip select generator deasserting the chip select input if the first signal is asserted, wherein the cache memory device is placed into the low power state in response to the chip select signal being deasserted;

wherein the special cycle is a halt special cycle, and wherein the microprocessor generates the halt special cycle on the bus if the microprocessor executes a halt instruction, the halt instruction causing operation of the microprocessor to cease and to place the microprocessor into low power consumption mode.

6,041,402

DIRECT VECTORED LEGACY INSTRUCTION SET EMULATION

William J. Cannon, Centerville; David K. Remnant, Dayton; Paul D. Ward, Franklin, and Timothy R. Hoerig, Beavercreek, all of Ohio, assignors to TRW Inc., Redondo Beach, Calif.

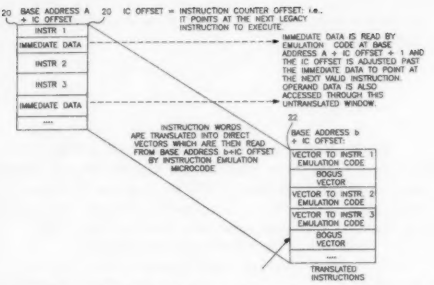
Filed Jan. 5, 1998, Appl. No. 2,960

Int. Cl.[7] G06F *9/30*

U.S. Cl. 712—200 **5 Claims**

1. An apparatus for emulating legacy instructions comprising:

means for emulating said legacy instructions, said emulating means including software routines for emulating said legacy instructions, the address of each software routine being identified by a vector;


20 BASE ADDRESS A + IC OFFSET
20 IC OFFSET = INSTRUCTION COUNTER OFFSET; i.e., IT POINTS AT THE NEXT LEGACY INSTRUCTION TO EXECUTE.
INSTR 1
IMMEDIATE DATA
INSTR 2
INSTR 3
IMMEDIATE DATA
IMMEDIATE DATA IS READ BY EMULATION CODE AT BASE ADDRESS A + IC OFFSET + 1 AND THE IC OFFSET IS ADJUSTED PAST THE IMMEDIATE DATA TO POINT AT THE NEXT VALID INSTRUCTION. OPERAND DATA IS ALSO ACCESSED THROUGH THIS UNTRANSLATED WINDOW.
22
BASE ADDRESS b + IC OFFSET:
INSTRUCTION WORDS ARE TRANSLATED INTO DIRECT VECTORS WHICH ARE THEN READ FROM BASE ADDRESS b+IC OFFSET BY INSTRUCTION EMULATION MICROCODE
VECTOR TO INSTR. 1 EMULATION CODE
BOGUS VECTOR
VECTOR TO INSTR. 2 EMULATION CODE
VECTOR TO INSTR. 3 EMULATION CODE
BOGUS VECTOR
TRANSLATED INSTRUCTIONS

means for translating said legacy instructions to direct vectors for said software routines for emulating said legacy instructions; and

means for fetching said direct vectors in response to requests for said legacy instructions.

6,041,403

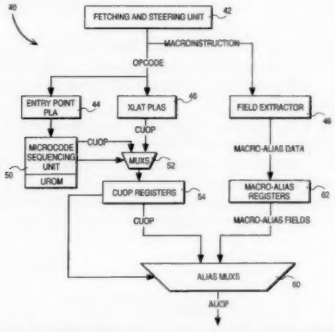
METHOD AND APPARATUS FOR GENERATING A MICROINSTRUCTION RESPONSIVE TO THE SPECIFICATION OF AN OPERAND, IN ADDITION TO A MICROINSTRUCTION BASED ON THE OPCODE, OF A MACROINSTRUCTION

Donald D. Parker, Beaverton; Darrell D. Boggs, Aloha, and Alan B. Kyker, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 27, 1996, Appl. No. 721,900

Int. Cl.[7] **G06F** *9/28*

U.S. Cl. 712—210 **34 Claims**



1. A method of decoding a macroinstruction, the macroinstruction including an operational code (opcode) and a specification of an operand, the method comprising:

generating a first micro-instruction for execution by an execution unit of a processor, the first micro-instruction being generated responsive to an opcode of the macroinstruction; and

generating a second micro-instruction for execution by an execution unit of the processor as a micro-instruction distinct and separate from the first micro-instruction, the second micro-instruction being generated responsive to only the specification of the operand of the macroinstruction, wherein the specification of the operand requires an operand data shifting operation or a memory address calculation operation prior to execution of the first micro-instruction generated responsive to the opcode of the macroinstruction.

6,041,404

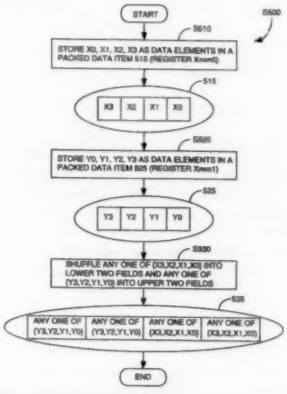
DUAL FUNCTION SYSTEM AND METHOD FOR SHUFFLING PACKED DATA ELEMENTS

Patrice Roussel, Portland; Srinivas Chennupaty, Oakland; Mike Cranford, Hillsboro, all of Oreg.; Mohammad Abdallah, Folsom, Calif.; Jim Coke, Shingle Springs, Calif., and Katherine Kong, Fair Oaks, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1998, Appl. No. 52,996

Int. Cl.[7] **G06F** *9/15*

U.S. Cl. 712—210 **24 Claims**


START
S500
S510
STORE X0, X1, X2, X3 AS DATA ELEMENTS IN A PACKED DATA ITEM 515 (REGISTER Xmm0)
S515
X3 X2 X1 X0
S520
STORE Y0, Y1, Y2, Y3 AS DATA ELEMENTS IN A PACKED DATA ITEM 525 (REGISTER Xmm1)
S525
Y3 Y2 Y1 Y0
S530
SHUFFLE ANY ONE OF (X3,X2,X1,X0) INTO LOWER TWO FIELDS AND ANY ONE OF (Y3,Y2,Y1,Y0) INTO UPPER TWO FIELDS
S535
ANY ONE OF (Y3,Y2,Y1,Y0)
ANY ONE OF (Y3,Y2,Y1,Y0)
ANY ONE OF (X3,X2,X1,X0)
ANY ONE OF (X3,X2,X1,X0)
END

1. A computer system comprising:

a hardware unit to transmit data representing graphics to another computer or a display;

a processor coupled to the hardware unit; and

a storage device coupled to the processor and having stored therein an instruction, which when executed by the processor, causes the processor to at least,

access a first packed data operand having at least two data elements;

access a second packed data operand having at least two data elements;

select a first set of data elements from the first packed data operand;

copy each of the data elements in the first set to specified data fields located in the lower half of a destination operand;

select a second set of data elements from the second packed data operand; and

copy each of the data elements in the second set to specified data fields located in the upper half of the destination operand.

6,041,405

INSTRUCTION LENGTH PREDICTION USING AN INSTRUCTION LENGTH PATTERN DETECTOR

Thomas S. Green, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1997, Appl. No. 993,476

Int. Cl.[7] **G06F** *9/38*

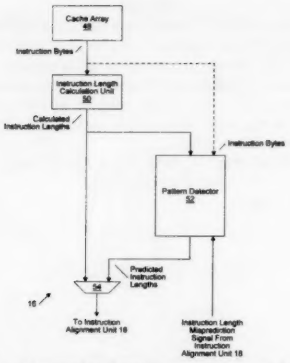
U.S. Cl. 712—213 **19 Claims**

1. A microprocessor configured to execute variable length instructions comprising:

a cache array configured to receive a fetch address and in response output a corresponding plurality of instruction bytes;

an instruction length calculation unit coupled to said cache array and configured to receive said plurality of instruction bytes, wherein said calculation unit is configured to generate a particular instruction length corresponding to a particular instruction within said plurality of instruction bytes; and

a pattern detector coupled to said cache array and said calculation unit, wherein said pattern detector is configured to store a plurality of instruction length sequences, wherein each of said



plurality of instruction length sequences comprises an initial sequence and a final sequence, wherein said pattern detector is configured to receive a particular initial sequence corresponding to a particular portion of code from said calculation unit and in response output a corresponding final sequence, wherein said corresponding final sequence is usable to predict the lengths of instructions following the particular portion of code.

6,041,406

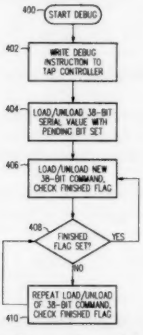
PARALLEL AND SERIAL DEBUG PORT ON A PROCESSOR

Daniel Mann, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Provisional application No. 60/043,070, Apr. 8, 1997. This application Dec. 19, 1997, Appl. No. 994,518.

Int. Cl.[7] **G06F** *11/34;11/28*

U.S. Cl. 712—227 **14 Claims**



7. A method of sending and receiving debug information between a processor-based device and external debug equipment, comprising:

sending debug information serially to and from a serial debug port in the processor-based device;

providing a trace memory in said processor-based device, said trace memory storing information indicative of an order in which instructions are executed by said processor based device;

providing a parallel debug port formed of a plurality of pins configured to send and receive debug signals in parallel;

accessing one of a plurality of debug registers via one of said serial and parallel debug ports, said debug registers being accessible to both said serial debug port and said parallel debug port;

performing a debug operation in said processor-based device in response to signals received at one of said parallel and serial debug ports; and

communicating results of said debug operation from said processor-based device over one of said parallel and serial debug ports.

6,041,407

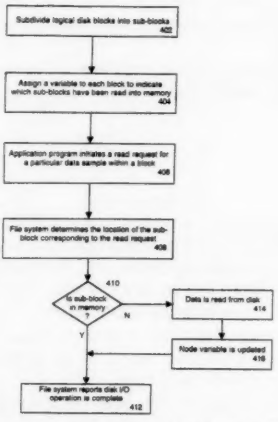
FILE SYSTEM BLOCK SUB-ALLOCATOR

Jeffrey Mark Claar, Aliso Viejo; Roger Mather Duvall, Garden Grove, and Richard Joseph Oliver, Laguna Beach, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Pictures Entertainment, Inc., Culver City, Calif.

Filed Sep. 24, 1997, Appl. No. 936,566

Int. Cl.[7] **G06F** *9/445*

U.S. Cl. 713—1 **11 Claims**


Subdivide logical disk blocks into sub-blocks
402
Assign a variable to each block to indicate which sub-blocks have been read into memory
404
Application program initiates a read request for a particular data sample within a block
406
File system determines the location of the sub-block corresponding to the read request
408
410
Is sub-block in memory ?
Y
N
Data is read from disk
414
Node variable is updated
416
File system reports disk I/O operation is complete
412

1. A method of reading data from a disk using a disk-based file system, the method comprising:

subdividing a logical block on said disk into a plurality of sub-blocks;

assigning a variable to said block, said variable configured to maintain the status of each of said plurality of sub-blocks with respect to whether data has been transferred from a particular sub-block to memory;

specifying a location corresponding to data which is to be transferred to said memory from said disk;

testing said variable to determine if said data has been previously transferred to said memory; and

transferring said data from said disk to said memory if said data has not been previously transferred to said memory.

6,041,408

KEY DISTRIBUTION METHOD AND SYSTEM IN SECURE BROADCAST COMMUNICATION

Mototsugu Nishioka, Kawasaki; Hisashi Umeki, Yokohama, and Susumu Matsui, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 25, 1997, Appl. No. 882,339

Claims priority, application Japan, Jun. 28, 1996, 8-168975; Aug. 9, 1996, 8-210811; Aug. 19, 1996, 8-217050; Oct. 11, 1996, 8-269613

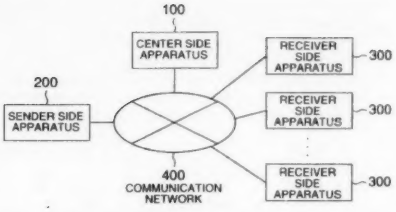
Int. Cl.[7] **H04K** *1/00*

U.S. Cl. 713—171 **42 Claims**

1. A key distribution system in which a sender and a plurality of receivers use individual key information generated beforehand by a key generator to share a common key information for performing a secure broadcast communication, wherein

(i) the key generator side is provided with:

means for generating confidential information of a receiver in association with a subset inclusive of at least two elements



of a first finite set **S1** on the basis of a space determined by a subset inclusive of at least two elements of a second finite set **S2**; and

means for distributing said confidential information to the receiver,

(ii) the sender side is provided with:

means for generating key distribution data corresponding to each element of said first finite set **S1**; and

communication means for making the multi-address transmission of said key distribution data,

and (iii) the receiver side is provided with:

storage means for storing said confidential information beforehand; and

means for calculating common key information K between the sender and the receiver from the stored confidential information for each receiver and the key distribution data.

6,041,409

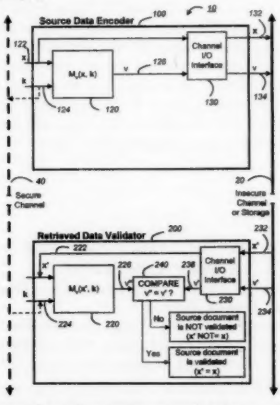
DEVICE AND METHOD FOR DATA INTEGRITY AND AUTHENTICATION

Liu Zunquan, 3500 Pennsylvania Ave. #107, Fremont, Calif. 94536

Continuation of application No. 08/845,803, Apr. 25, 1997, Pat. No. 5,771,292. This application Apr. 14, 1998, Appl. No. 59,918.

Int. Cl.[7] **H04L** *9/32;9/30;9/00*

U.S. Cl. 713—176 **10 Claims**



1. In a system for a first entity to authenticate a second entity, said second entity claiming to be one previously been certified by issuance of a security token thereto, the system comprising:

a mapping shared between said first and second entities, said mapping dependent on at least first and second variables;

an authentication device of said first entity;

a transponder device of said second entity, and

wherein said authentication device of said first entity comprises:

means for receiving a certified copy of said security token;

means for deriving a specified value for the first variable of said mapping from said security token;

means for generating a specified value for the second variable of said mapping;

means for computing a first authentication code by evaluating said mapping at the respective specified value of the two variables;

means for transmitting the specified value for the second variable to said second entity; and

wherein said transponder device of said second entity comprises:

means for receiving a copy of said security token;

means for deriving the specified value for the first variable of said mapping from said security token;

means for receiving the specified value for the second variable from said first entity;

means for computing a second authentication code by applying said mapping evaluated at the respective specified value of the two variables; and

wherein said authentication device of said first entity further comprises:

means for receiving said second authentication code;

means for comparing said first and second authentication codes, thereby determining the authenticity of said second entity by whether or not the specified values of the first and second variables between said first and second entities are identical.

6,041,410

PERSONAL IDENTIFICATION FOB

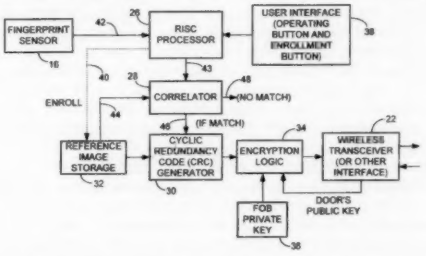
Shi-Ping Hsu, Pasadena, Calif.; James M. Ling, Great Falls, Va.; Arthur F. Messenger, and Bruce W. Evans, both of Redondo Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 22, 1997, Appl. No. 995,267

This patent is subject to a terminal disclaimer.

Int. Cl.[7] **H04L** *9/10;9/30*

U.S. Cl. 713—186 **6 Claims**



1. A personal Identification fob for automatically verifying the identity of a user seeking to use the fob for access to a protected property, the fob comprising:

a sensor, for reading fingerprint data identifying a user seeking access to a protected property;

a memory for storing a reference fingerprint image of the user during an enrollment procedure and for holding the reference image for future use;

an image correlator, for comparing the stored reference image with a fingerprint image of the user seeking access, as obtained from the sensor, and for determining whether the two images match; and

means for securely communicating identity confirmation to a door that provides access to the protected property upon receipt of the identity confirmation, wherein the means for securely communicating identity confirmation includes

means for generating a numerical value from the stored reference fingerprint image, including means for generating a cyclic redundancy code from the stored reference fingerprint image,

encryption logic, for encrypting the numerical value, and

a transmitter for sending the encrypted numerical value to the door, together with user identification data,

wherein the door provides the desired access to the protected property upon confirming that the transmitted numerical value is the same as one previously provided by the user during a registration procedure.

6,041,411

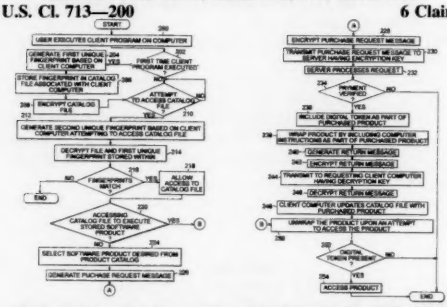
METHOD FOR DEFINING AND VERIFYING USER ACCESS RIGHTS TO A COMPUTER INFORMATION

Stuart Alan Wyatt, 24806 SE. Mirrormont Way, Issaquah, Wash. 98027

Filed Mar. 28, 1997, Appl. No. 827,548

Int. Cl.[7] G06F *13/00;* **H04L** *9/32;9/12;* **H04K** *1/00*

U.S. Cl. 713—200 **6 Claims**



1. A computer-implemented method for securing digital information to a first computing system received from a second computing system, the first and second computing systems each including one or more computing devices, the computer-implemented method comprising:

(a) requesting at least a portion of the digital information from the second computing system;

(b) transmitting the requested digital information from the second computing system to the first computing system, the requested digital information being wrapped with digital instructions recognizable by the first computing system; (c) electronically unwrapping the requested digital information at the first computing system in accordance with the digital instructions, wherein when unwrapped, the requested digital information is available for use by the first computing system; and

(d) storing a catalog file on the first computing system and electronically locking the catalog file to the first computing system by generating a first digital identifier uniquely corresponding to particular attributes of the first computing system and storing the first digital identifier as an associated portion of the catalog file, wherein the catalog file identifies the digital information available to be transmitted from the second computing system;

wherein

a determination is made as to whether the catalog file is validly located on a computing system by:

(a) generating a second digital identifier; and

(b) comparing the first digital identifier to the second digital identifier to determine whether the first digital identifier corresponds to the second digital identifier;

the first digital identifier is a function of the first computing system but is not a function of the requested digital information or the catalog file; and

said electronically unwrapping is performed upon an attempt to access the requested digital information by a computing system on which the requested digital information and the catalog file resides, said electronically unwrapping comprising:

(a) making said determination as to whether the catalog file is validly located on the computing system attempting to access the requested digital information;

(b) checking the catalog file for the presence of a product activation code corresponding to the requested digital information; and

(c) allowing access to the digital information only where the catalog file is validly located on the computing system attempting to access the requested digital information and the product activation code is present in the catalog file, wherein the product activation code is a function of the requested digital information but is not a function of the first computing system.

6,041,412

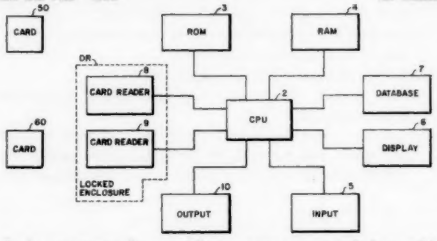
APPARATUS AND METHOD FOR PROVIDING ACCESS TO SECURED DATA OR AREA

Colin J. Timson; Chas Hock Eng Yap, and Sean Kelly, all of Bristol, United Kingdom, assignors to TL Technology Rereach (M) SDN. BHD., Kuala Lumpar, Malaysia

Filed Nov. 14, 1997, Appl. No. 970,689

Int. Cl.[7] G06F *12/14*

U.S. Cl. 713—200 **11 Claims**



1. An apparatus for providing access to secured data, which comprises:

a central processing device ("CPD") for controlling the operation of said apparatus;

a first device coupled to said CPD for receiving a first data set of information from an enabling secure data module ("SDM"), said first data set including at least one decryption key; and

a second device coupled to said CPD for receiving a second data set of information from, an interrogatable SDM, said second data set including encrypted biometrics data for the holder of said interrogatable SDM;

wherein said central processing device controls an operation of at least one of said first data receiving device and said second data receiving device; wherein said CPD provides a query to said enabling SDM in order to request an authorization from said enabling SDM to access said second data set of information from said interrogatable SDM; and further wherein said enabling SDM provides said at least one decryption key for decryption of said encrypted biometrics data.

6,041,413

SECURITY CONTROL FOR COMPUTER POWER SUPPLY SUBSYSTEM

Cheng-Chih Wang, Chupei, Taiwan, assignor to Winbond Electronics Corp., Hsinch, Taiwan

Filed Jun. 6, 1997, Appl. No. 886,009

Claims priority, application Taiwan, May 30, 1997, 86107361

Int. Cl.[7] G06F *11/00*

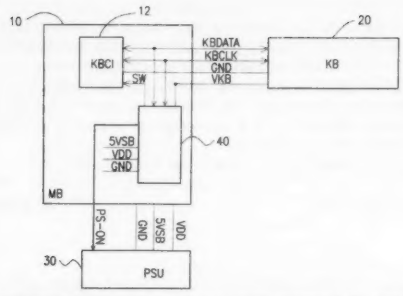
U.S. Cl. 713—202 **14 Claims**

1. A power-up security control apparatus for a computer system having a mainboard circuitry, a power supply, and a keyboard, the apparatus comprising:

a keyboard intercept unit for intercepting keyboard signals capable of communicating between a keyboard controller interface of the mainboard circuitry and the keyboard when the computer system is off;

a keyboard input data decoder for receiving and decoding the keyboard signals intercepted by the keyboard intercept unit;

a buffer connected to an output of the keyboard input data decoder for storing the decoded keyboard signals in a predetermined format;



a password memory for storing a preset password for authorizing the computer system to power up;

a comparing unit having inputs connected to the output of the buffer and the password memory, the comparing unit comparing the decoded keyboard signals and the preset password and generating a matching condition signal indicating whether the decoded keyboard signals and the preset password match; and

a power supply control unit receiving the matching condition signal and subsequently generating a control signal based on a logical status of the matching condition signal in order to control the power supply of the computer system.

6,041,414

UNINTERRUPTIBLE POWER SUPPLY APPARATUS WHICH SUPPLIES GUARANTEED POWER TO ELECTRONIC APPARATUSES IN A SYSTEM

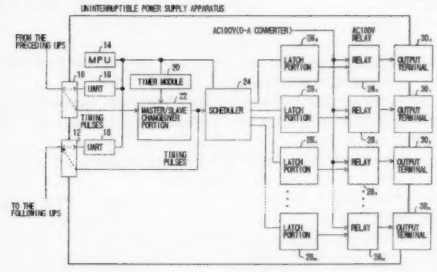
Kazuhito Kikuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 6, 1997, Appl. No. 870,735

Claims priority, application Japan, Dec. 3, 1996, 8-322993

Int. Cl.[7] G06F *1/00*

U.S. Cl. 713—300 **8 Claims**



1. An uninterruptible power supply apparatus supplying power to electronic apparatuses, comprising:

a plurality of output terminals supplying power;

a timing holding unit holding timing information of a power supply start and/or stop of respective ones of said plurality of output terminals, said timing information being set independently for each of said plurality of output terminals; and

a timing pulse generating unit generating timing pulses for reading out the timing information from said timing holding unit,

wherein the power supply start and/or stop of each output terminal is performed based on the timing information read out from said timing holding unit and the timing information held by said timing holding unit is set by a user.

6,041,415

FIELD BUS ARRANGEMENT HAVING INDEPENDENT POWER CIRCUITS AND CONTROL CIRCUITS

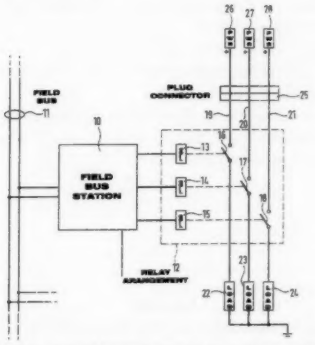
Karl-Heinz Förster, Commack, and Robert Conde, Coram, both of N.Y., assignors to Festo AG & Co, Esslingen, Germany

Filed Oct. 7, 1997, Appl. No. 946,400

Claims priority, application Germany, Oct. 11, 1996, 296 17 686 U

Int. Cl.[7] G06F *1/26;* **H02J** *13/00*

U.S. Cl. 713—300 **11 Claims**



1. A field bus arrangement comprising at least one field bus station adapted to be connected with a serial field bus, the field bus station capable of receiving instruction from the field bus and selectively generating a control output, and at least one load adapted to be controlled by way of the control output of the field bus station, wherein the at least one load is connected by way of a controlled switch with a power supply line provided in addition to lines of the field bus, wherein the power supply line is able to be switched on and switched off independently from the field bus station and the controlled switch is able to be selectively operated by the control output of the field bus station.

6,041,416

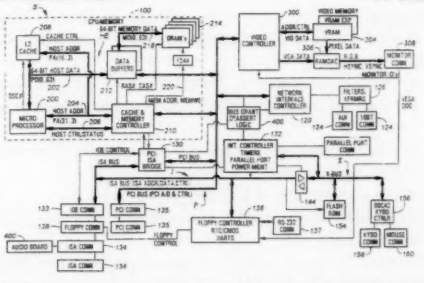
CIRCUIT FOR REDUCING AUDIO AMPLIFIER NOISE DURING POWERING ON AND OFF

Henry F. Lada, Jr., Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of application No. 08/818,346, Mar. 15, 1997, Pat. No. 5,794,057, which is a continuation of application No. 08/398,396, Mar. 3, 1995, Pat. No. 5,740,453. This application Mar. 9, 1998, Appl. No. 36,822.

Int. Cl.[7] G06F *13/00*

U.S. Cl. 713—330 **23 Claims**



1. An apparatus for controlling noise signals resulting from transients generated by the power-up or power-down of portions of a computer, said computer having a status signal indicative of the power state of the portions of the computer, the status signal being asserted to indicate power is being supplied to the portions and

being deasserted to indicate power is not being supplied to the portions, said apparatus comprising:

a power indicator having an input to receive the status signal and an output to provide a power indicator signal, the power indicator signal being asserted in response to the status signal being asserted and being deasserted a first delay time after the status signal is deasserted;

a mute indicator having an input to receive the status signal and an output to provide a mute indicator signal, the mute indicator signal being asserted in response to the status signal being deasserted and being deasserted a second delay time after the status signal is asserted;

an amplifier with a volume control input and a power supply input, said volume control input coupled to the output of said mute indicator; and

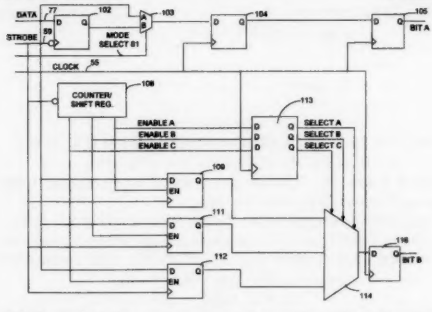
a power switch having a control input coupled to the output of said power indicator and an output coupled to said power supply input of said amplifier.

6,041,417

METHOD AND APPARATUS FOR SYNCHRONIZING DATA RECEIVED IN AN ACCELERATED GRAPHICS PORT OF A GRAPHICS MEMORY SYSTEM

Maynard D. Hammond, Lawrenceville, Ga., and James M. Dewey, Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 4, 1998, Appl. No. 90,440
Int. Cl.[7] G06F *1/12*
U.S. Cl. 713—400 **23 Claims**



16. A method for synchronizing data with a clock signal, the clock signal having a clock cycle, wherein the data is being transmitted on the rising and falling edges of a strobe signal, the method comprising the steps of:

receiving data transmitted on the falling edge of a strobe signal and delaying the received data for a first predetermined delay period;

outputting the received data after the first predetermined delay period has ended;

detecting a rising edge of the strobe signal;

capturing the data transmitted on the detected rising edge of the strobe signal;

delaying the captured data for a second predetermined delay period; and

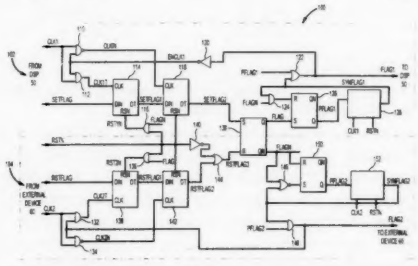
outputting the captured data after the second predetermined delay period has ended, wherein the data that is output after the first and second delay periods have passed is synchronized with the clock signal.

6,041,418

RACE FREE AND TECHNOLOGY INDEPENDENT FLAG GENERATING CIRCUITRY ASSOCIATED WITH TWO ASYNCHRONOUS CLOCKS

Feng Chen, Bethlehem; Ravi K. Kolagotla, Lansdale; Le T. Ly, Allentown; Jiancheng Mo, Allentown, and Hosahalli R. Srinivas, Allentown, all of Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Aug. 7, 1998, Appl. No. 131,373
Int. Cl.[7] G06F *1/12*
U.S. Cl. 713—400 **62 Claims**



1. A circuit for generating a control flag, said circuit comprising:

a first component connected to receive and be responsive to a first input signal, said first component generating a first flag signal representing said control flag to control a first device and generating a first output signal representing said first input signal;

a second component connected to receive and be responsive to a second input signal, said second component generating a second flag signal representing said control flag to control a second device and generating a second output signal representing said second input signal; and

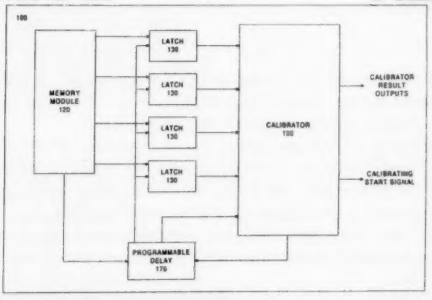
a third component connected to and responsive to said first and second output signals, said third component generating outputs connected to said first and second components, said outputs preventing said first and second flag signals from being generated by said first and second components at the same time.

6,041,419

PROGRAMMABLE DELAY TIMING CALIBRATOR FOR HIGH SPEED DATA INTERFACE

Chi-Jung Huang, Saratoga, and Ken Ming Li, Santa Clara, both of Calif., assignors to S3 Incorporated, Santa Clara, Calif.

Filed May 27, 1998, Appl. No. 85,984
Int. Cl.[7] G06F *1/12*
U.S. Cl. 713—401 **19 Claims**



1. A calibration system comprising:

a programmable delay module including a plurality of stages of delay for receiving a first signal and for transmitting a second signal, said second signal corresponding to the first signal

delayed by a delay value indicative of at least one of the plurality of stages of delay;

a latch that responds to the receipt of the second signal by sampling a third signal and transmitting a fourth signal; and

a result comparator, coupled to the latch, for comparing the third signal to the fourth signal, for responding to the fourth signal matching the third signal by transmitting a fifth signal having a first logic state and for responding to the fourth signal not matching the third signal by transmitting a fifth signal having a second logic state.

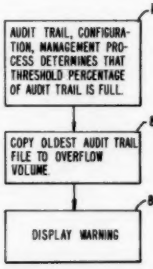
6,041,420
MULTI-VOLUME AUDIT TRAILS FOR FAULT TOLERANT COMPUTERS

Michael J. Skarpelos, San Jose; Robbert van der Linden, Scotts Valley; William J. Carley; James M. Lyon, both of San Jose, all of Calif., and Matthew C. McCline, Bellevue, Wash., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of application No. 08/688,629, Jul. 29, 1996, Pat. No. 5,764,879, and a continuation-in-part of application No. 08/377,075, Jan. 23, 1995, Pat. No. 5,590,274. This application Mar. 3, 1998, Appl. No. 34,199.

Int. Cl.[7] **G06F** *11/34*

U.S. Cl. 714—7 **5 Claims**


800
AUDIT TRAIL, CONFIGURATION, MANAGEMENT PROCESS DETERMINES THAT THRESHOLD PERCENTAGE OF AUDIT TRAIL IS FULL.
802
COPY OLDEST AUDIT TRAIL FILE TO OVERFLOW VOLUME
804
DISPLAY WARNING

1. In a fault tolerant computer system having an audit generator, and a configuration management process that rotates storage of audit records generated by said audit generator through a trail of audit files stored on plural disk storage units, wherein after a selected audit file becomes full, audit records stored in the selected audit file are migrated to a long-term storage medium, leaving the selected audit file available to receive further audit trail records from said audit generator, a method for responding to excess generation of audit trail records comprising the steps of:

monitoring, using said configuration management process, filling of audit files of said trail with audit records and migration of audit files of said trail to said long-term storage medium; and

upon a first threshold percentage of audit files of said trail becoming full without having been migrated to said long-term storage medium, migrating at least one of said full unmigrated audit files to an overflow file on a selected one of the plural disk storage units.

6,041,421
STORAGE APPARATUS SYSTEM

Akira Yamamoto, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

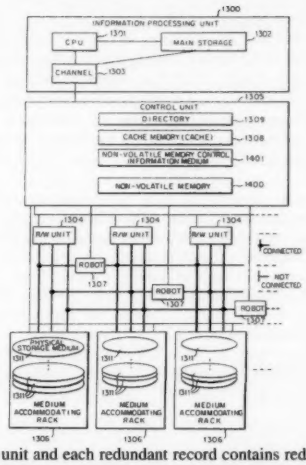
Filed Mar. 13, 1998, Appl. No. 41,785

Claims priority, application Japan, Mar. 14, 1997, 9-060506

Int. Cl.[7] **G06F** *11/00*

U.S. Cl. 714—7 **30 Claims**

21. A method of controlling a storage apparatus system which includes at least one storage medium group comprising a plurality of storage media for storing data records and redundant records, wherein each data record contains data accessed by an information



processing unit and each redundant record contains redundant data for recovering data contained in said data records, at least one spare storage media for storing data stored in a storage media incurring a failure and at least one medium accommodating rack comprising a plurality of accommodation units each accommodating one of said storage media or one of said spare storage media, said method comprising the steps of:

selecting, upon occurrence of a failure in any of said storage media of said storage medium group, one of said spare storage media for storing data stored in said storage media incurring a failure;

storing said data stored in said storage media incurring a failure in said selected spare storage media; and

restoring said selected spare storage media to an accommodation unit different from an accommodation unit originally occupied by said selected spare media upon completion of said storing step.

6,041,422
FAULT TOLERANT MEMORY SYSTEM

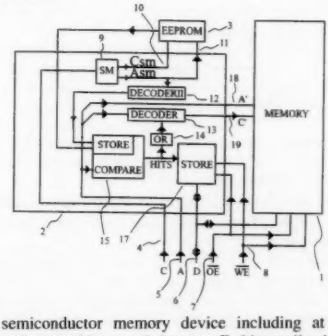
Alexander Roger Deas, Edinburgh, United Kingdom, assignor to Memory Corporation Technology Limited, United Kingdom

Continuation of application No. 08/525,586, filed as application No. PCT/GB94/00577, Mar. 21, 1994, abandoned. This application Oct. 24, 1997, Appl. No. 959,963.

Claims priority, application United Kingdom, Mar. 19, 1993, 9305801

Int. Cl.[7] **G06F** *11/20*

U.S. Cl. 714—8 **17 Claims**



1. A semiconductor memory device including at least one memory cell array chip, coupled to an off-chip application specific integrated circuit device (ASIC) (**2**), said ASIC including a redun-

dancy configuration comprising a redundancy memory cell array (**17**), a defective memory address storing circuit (**3**), an address comparing circuit and a redundancy memory cell selecting circuit (**21**,**22**,**14**), said ASIC further including associative storage means (**15**) having a plurality of storage elements each of which is coupled to a corresponding element in said redundancy memory cell array (**17**) and control means (**16**) for enabling or disabling said corresponding element according to whether an associated element in said at least one memory cell array chip is accessed or not, wherein:

said redundant memory cell array (**17**) comprises a plurality of substitute storage locations (**25**) mapped to corresponding defective locations in said at least one memory cell array chip, and said address comparing circuit comprises a plurality of comparators (**21**) each of which is arranged to compare a received address signal with a corresponding one of the addresses of the defective locations and which is coupled via a corresponding dedicated line to a corresponding one of the substitute storage locations (**25**) for enabling a read and/or write access to that substitute location and for disabling said at least one memory cell array chip if the compared addresses match; and

each of the storage elements of the associative storage means comprises a register means (**20**) for storing as a binary word the address of one of a plurality of defective locations in said at least one memory cell array chip and wherein each of the comparators is arranged individually to compare each of the bits stored in the register means with corresponding bits of the received address and to combine the results of the individual comparisons to provide a comparison result.

6,041,423

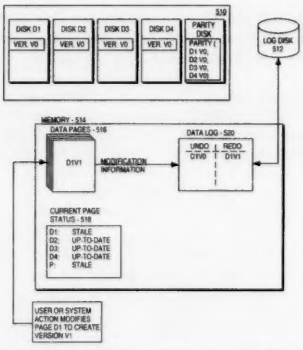
METHOD AND APPARATUS FOR USING UNDO/REDO LOGGING TO PERFORM ASYNCHRONOUS UPDATES OF PARITY AND DATA PAGES IN A REDUNDANT ARRAY DATA STORAGE ENVIRONMENT

Alex Tsukerman, Foster City, Calif., assignor to Oracle Corporation, Redwood Shores, Calif.

Filed Nov. 8, 1996, Appl. No. 747,064

Int. Cl.[7] **G06F** *11/00*

U.S. Cl. 714—19 **24 Claims**



1. A method of updating data in a redundant array storage system that includes a plurality of data pages and a corresponding parity page, the method comprising:

performing multiple modifications to the plurality of data pages;

deferring update of the parity page until after the multiple modifications have been performed;

updating the parity page in a single parity page update operation to bring the parity page up to date with the multiple modifications performed on the plurality of data pages, wherein updating the parity page in a single parity page update operation comprises updating the parity page based on most recent versions of each of the plurality of data pages;

retaining information in a data log for undoing the multiple modifications and for re-doing the multiple modifications;

detecting loss of one of the most recent versions of the plurality of data pages due to a system failure, the system failure occurring after one or more of the plurality of data pages in the redundant array storage system is updated to reflect the multiple modifications and before updating the parity page; and

regenerating the one of the most recent versions of the plurality of data pages based on the information in the data log and a stale version of the parity page.

6,041,424

METHOD OF ANALYZING SEMICONDUCTOR DEVICE OPERATION, METHOD OF ANALYZING SPECIFIC PHYSICAL PHENOMENA, AND APPARATUS FOR PERFORMING THESE METHODS

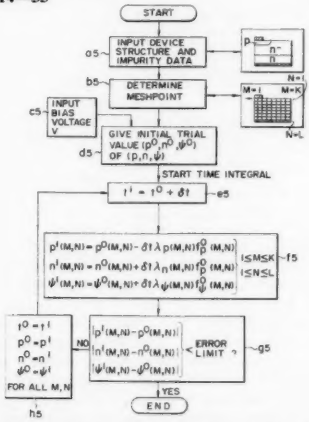
Mamoru Kurata, and Shin Nakamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of application No. 07/588,328, Sep. 26, 1990, abandoned. This application Nov. 30, 1992, Appl. No. 983,288.

Claims priority, application Japan, Sep. 29, 1989, 1-252189; Dec. 22, 1989, 1-331109; Mar. 2, 1990, 2-49484; Jul. 16, 1990, 2-187752

Int. Cl.[7] **G06F** *17/50*

U.S. Cl. 714—33 **18 Claims**



1. A method for modeling a semiconductor device by analyzing simultaneous equations consisting of electron- and hole-transport equations and Poisson's equation by means of a computer, said method comprising the steps of:

obtaining a representation of at least a structure and impurity concentrations of the semiconductor device;

rewriting the simultaneous equations to the following equations (a), (b), (c) containing time differential terms dp/dt, dn/dt, dψ/dt and sensitivity coefficients λ_p, λ_n, and λ_ψ:

$$dp/dt=-\lambda_p f_p \quad (a)$$

$$dn/dt=\lambda_n f_n \quad (b)$$

$$d\psi/dt=\lambda_\psi f_\psi \quad (c)$$

determining meshpoints (M,N) having spatial position dependency corresponding to the at least a structure and impurity concentrations of the semiconductor device;

transforming equations (a), (b) and (c) to the following equations (d), (e) and (f):

$$dp(M,N)/dt=-\lambda_p(M,N)f_p(M,N) \quad (d)$$

$$dn(M,N)/dt=\lambda_n(M,N)f_n(M,N) \quad (e)$$

$$d\psi(M,N)/dt=\lambda_{\psi}(M,N)f_{\psi}(M,N) \quad (f)$$

linearizing equations (d), (e) and (f), discreting the same with respect to time, and transforming the same to the following vector equation:

$$\begin{pmatrix}\delta p\\ \delta n\\ \delta\psi\end{pmatrix}_{i+dt} = A\begin{pmatrix}\delta p\\ \delta n\\ \delta\psi\end{pmatrix}_{i} \quad (g)$$

time-integrating equation (g) after obtaining such the sensitivity coefficients that an eigen value of an error propagation matrix A contained in equation (g) is less than 1, thereby solving the simultaneous equations; and

producing a model of said semiconductor device having physical values (p,n) at the respective meshpoints (M,N) obtained by using the solved simultaneous equations.

6,041,425

ERROR RECOVERY METHOD AND APPARATUS IN A COMPUTER SYSTEM

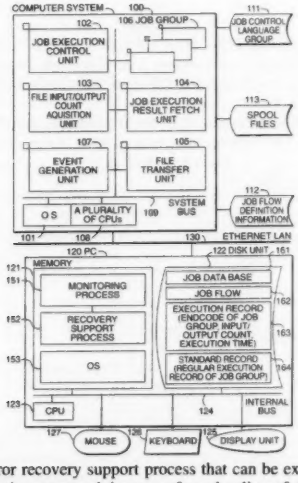
Motohide Kokunishi, Hachiouji; Hiromu Kato, Yokohama; Tsutomu Ito, Kanagawa, and Toshio Hirosawa, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1997, Appl. No. 921,572

Claims priority, application Japan, Sep. 3, 1996, 8-252487

Int. Cl.[7] G06F *11/277*

U.S. Cl. 714—37 **44 Claims**



12. An error recovery support process that can be executed in a recovery routine executed in one of a plurality of CPUs in a computer system, comprising:

executing a plurality of JOBs of a JOB group multiple times and storing an execution record for each JOB executed;

comparing the execution record of the JOB group when an error occurs with a regular execution record of the JOB group, the regular execution record being the execution record when the JOB group was executed normally;

detecting the cause of the error from said comparing;

storing an end code as the execution record for each execution of a JOB;

wherein said comparing compares the end code when the error occurs with the end code when no error occurs for JOBs of the JOB group and said detecting detects a JOB having a different end code as the cause of the error;

storing an execution time of each JOB as the execution record for the JOB;

wherein said comparing compares the execution time when the error occurs with the execution time when no error occurs for JOBs of the JOB group; and

wherein said detecting detects a JOB, whose execution time is out of a fixed minimum and maximum value of the execution time when no error occurs, as the cause of the error; and:

storing an input/output count as the execution record for each execution of a JOB;

wherein said comparing compares the input/output count when the error occurs with the input/output count without an error and

said detecting detects a JOB, whose input/output count is out of a fixed amount greater or less than the input/output count when no error occurs, as the cause of the error.

6,041,426

BUILT IN SELF TEST BIST FOR RAMS USING A JOHNSON COUNTER AS A SOURCE OF DATA

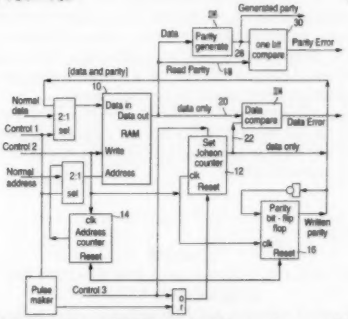
Fazal Ur Rehman Qureshi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of application No. 08/502,574, Jul. 14, 1995, Pat. No. 5,689,466, which is a continuation-in-part of application No. 08/418,499, Apr. 7, 1995, abandoned. This application Oct. 24, 1997, Appl. No. 957,262.

This patent is subject to a terminal disclaimer.

Int. Cl.[7] G11C *29/00;7/00*

U.S. Cl. 714—719 **1 Claim**



1. A built in self test (BIST) method for testing an addressable circuit structure, the BIST method comprising:

providing a Johnson counter that provides its data output and its parity bit output as a data input to the addressable circuit structure;

initiating an address counter to count from zero to the full address range of the addressable circuit structure;

for each address provided by the address counter to the addressable memory structure, writing the data output and parity bit output from the Johnson counter to said address, reading the data and parity bit from said address, and comparing the data read from said address to the data and the parity bit read from the parity bit output of the Johnson counter; and written to said address

in the event there is a mismatch between the read data and the written data or between the read parity bit and the parity bit output, generating an interrupt signal.

6,041,427

SCAN TESTABLE CIRCUIT ARRANGEMENT

Paul S. Levy, Chandler, Ariz., assignor to VLSI Technology, San Jose, Calif.

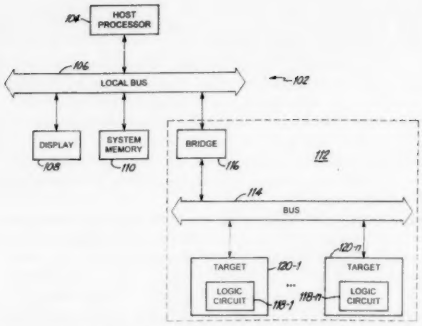
Filed Oct. 27, 1997, Appl. No. 958,530

Int. Cl.[7] G01R *31/28*

U.S. Cl. 714—724 **25 Claims**

1. A scan testable circuit arrangement, comprising:

a bus;



a plurality of logic circuits, each logic circuit having a plurality of scan test ports and a plurality input/output ports;

a first plurality of switches, each having a first terminal coupled to a predetermined signal line of the bus and a second terminal coupled to a respective one of the scan test ports of the logic circuits;

a second plurality of switches, each having a first terminal coupled to a predetermined signal line of the bus and a second terminal coupled to a respective one of input/output ports of the logic circuits;

a plurality of command decoders, coupled to the bus to receive bus commands and coupled to the gates of the first and second plurality of switches, configured and arranged to couple the scan test ports to the bus for a first operational mode responsive to a first set of the bus commands, and couple the input/output ports to the bus for a second operational mode responsive to a second set of commands and

a buffer circuit arranged to couple the bus to a local bus; and

a bypass circuit coupled to the bus and arranged to couple the bus to the local bus and bypass the buffer circuit during the first operational mode.

6,041,428

CONNECTION MATRIX FOR A MICROCONTROLLER EMULATION CHIP

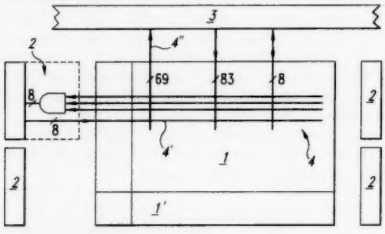
Sergio Pelagalli, Corsico, and Marco Losi, Milan, both of Italy, assignors to STMicroelectronics S.R.L., Agrate Brianza, Italy

Filed Mar. 5, 1998, Appl. No. 40,249

Claims priority, application European Pat. Off., Mar. 5, 1997, 97830097

Int. Cl.[7] G09R *31/28*

U.S. Cl. 714—734 **53 Claims**



1. A connection matrix for a microcontroller emulation chip, comprising comprising:

first and second MOS transistors connected in series with each other between first and second voltage references, and having their drain terminals in common to form a first internal circuit node;

third and fourth MOS transistors, also connected in series with each other between the first and second voltage references, and having their drain terminals in common to form a second internal circuit node, wherein said first and second transistors have their control terminals connected together and to the second internal circuit node, and said third and fourth transistors have their control terminals connected together and to the first internal circuit node;

fifth and sixth MOS transistors, respectively connected between first and second input terminals of the RAM cell and said first and second internal circuit nodes, and having respective control terminals connected to a third input terminal of the RAM cell;

at least one controlled switch connected between said first and second internal circuit nodes adapted to control said switch on/off, and provided with first and second connecting terminals between horizontal and vertical lines of the matrix;

special test cells connected to first and second testing terminals and comprising a first and second bypass switches connected between said first and second internal circuit nodes and the controlled switch of the special test cells;

a first buffer transistor connected between the first bypass switch and the second voltage reference and connected to the controlled switch of the test cell;

a second buffer transistor connected between the second internal circuit node and the second connecting terminal of the test cell and connected to the first test terminal;

a third buffer transistor connected between the first voltage reference and the controlled switch of the test cell and connected to the second testing terminal; and

a fourth buffer transistor connected between the first internal circuit node and the second connecting terminal and connected to the first testing terminal of the test cell.

6,041,429

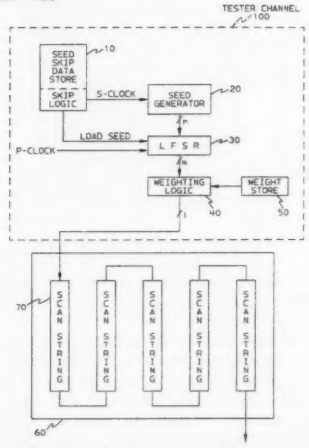
SYSTEM FOR TEST DATA STORAGE REDUCTION

Bernd Karl Ferdinand Koenemann, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of application No. 07/534,600, Jun. 7, 1990, abandoned. This application Aug. 4, 1993, Appl. No. 101,641.

Int. Cl.[7] G06F *11/00*

U.S. Cl. 714—738 **4 Claims**



1. A circuit for generating sequences of test pattern bits, especially for application to large integrated circuit chips and systems designed with at least one scan path for testing, said circuit comprising:

pseudo-random pattern generator means including a plurality of register elements and a means for cycling said generator means so as to provide an output bit stream;

weighting means for receiving said output bit stream from said pattern generator and for generating bit sequences having a

selectively biased probability distribution of zeroes and ones in the bit sequences from said weighting means;

reseeding means for generating seed values to be loaded into the register elements within said pseudo-random pattern generator means at the beginning of new output bit streams; and

seed skipping means for causing said reseeding means to depart from a pre-established seed sequence by skipping over specified numbers of otherwise generated seed values.

6,041,430

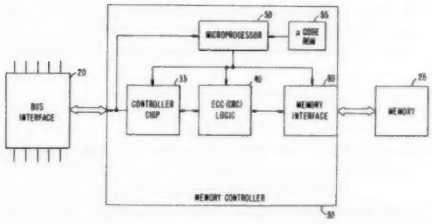
ERROR DETECTION AND CORRECTION CODE FOR DATA AND CHECK CODE FIELDS

Alan M. Yamauchi, Saratoga, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Nov. 3, 1997, Appl. No. 963,501

Int. Cl.[7] **H03M** *13/00*

U.S. Cl. 714—752 **20 Claims**



1. A method of detecting errors in data, comprising the steps of:

a) generating a 9-bit check field for a 135-bit data field;

b) appending said check field to said data field so as to create a 144-bit cumulative data field;

c) transporting said cumulative data field to an agent;

d) generating a 9-bit syndrome (S[**8:0**]) for detecting errors using said cumulative data field; and

e) determining, based on said syndrome, whether said cumulative data field includes an error.

6,041,431

METHOD AND APPARATUS FOR PERFORMING ERROR CORRECTION CODE OPERATIONS

Arthur M. Goldstein, Santa Cruz, Calif., assignor to Adapter, Inc., Milpitas, Calif.

Filed Sep. 19, 1997, Appl. No. 933,568

Int. Cl.[7] **H03M** *13/00*

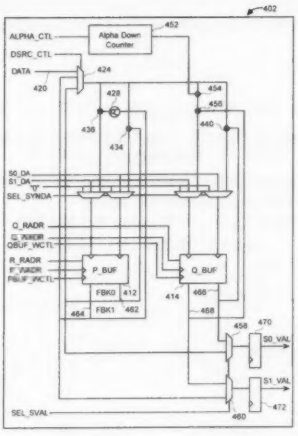
U.S. Cl. 714—784 **27 Claims**

1. A method for processing encoded data using error control coding comprising:

obtaining Q codewords and P codewords from a single pass through a codeword storage location, said P codewords and Q codewords defining a block of data bytes, wherein each of said P codewords includes data bytes defining a column in said block and wherein each of said Q codewords includes data bytes defining a diagonal in said block;

calculating Q partial syndromes for said diagonal Q codewords;

calculating P partial syndromes for said column P codewords; and



storing said Q partial syndromes and said P partial syndromes in a buffer separate from said codeword storage location.

6,041,432

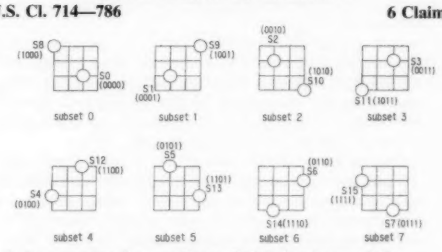
APPARATUS AND METHOD FOR DETECTING SIGNAL POINTS USING SIGNAL POINT-MAPPING

Tamotsu Ikeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of application No. 08/394,507, Feb. 27, 1995, Pat. No. 5,717,706. This application Jan. 8, 1997, Appl. No. 780,347. Claims priority, application Japan, Mar. 4, 1994, 6-034328

Int. Cl.[7] **G06F** *11/10;* **H03M** *13/12*

U.S. Cl. 714—786 **6 Claims**



1. An apparatus for encoding a digital signal comprising:

encoding means for convolution encoding said digital signal, said encoded digital signal including a bit corresponding to parallel path information;

mapping means for mapping said encoded signal onto one of a plurality of predetermined signal points, said signal points being divided into a plurality of subsets, said plurality of subsets comprising at least two groups, each group having at least four subsets, each subset having at least first and second signal points arranged with respect to a reference point, wherein the first and second signal points of a first subset respectively correspond to the first and second signal points of a second subset when said first subset is rotated through an angle ϕ about said reference point, and a respective bit corresponding to respective parallel path information of the first signal point of said first subset being equal to a respective bit corresponding to respective parallel path information of the first signal point of said second subset and a respective bit corresponding to respective parallel path information of the second signal point of said first subset being equal to a respective bit corresponding to respective parallel path information of the second signal point of said second subset; and

modulating means for modulating the mapped signal.

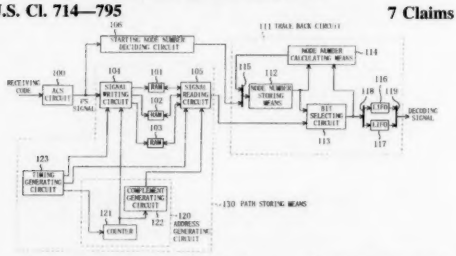
wherein the respective bit corresponding to respective parallel path information is the most significant bit of said digital signal.

6,041,433

VITERBI DECODER AND VITERBI DECODING METHOD

Takehiro Kamada, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 7, 1997, Appl. No. 833,483
Int. Cl.[7] H03M *13/00;13/12*
U.S. Cl. 714—795 **7 Claims**



1. A Viterbi decoder for decoding input received codes by a path trace technique wherein the constraint length of an encoder on the sending side is K and the trace-back length as a trace-back unit for decoding is m, each of said number K and said number m being a positive integer,

said Viterbi decoder comprising:

(a) an add-compare-select (ACS) circuit for accepting said received codes and for generating in response to each of said received codes a path select signal of $2^{(K-1)}$ bits, each of said $2^{(K-1)}$ bits corresponding to a respective node indicative of a state of said encoder;

(b) path storing means for storing m path select signals per unit from said ACS circuit;

(c) a starting node number deciding circuit for receiving m path select signals per unit from said ACS circuit and for determining, based on said m path select signals received, a starting node number for decoding which is a terminal node number through which a most likely path passes of a path select signal just before said m path select signals; and

(d) a trace-back circuit for receiving m path select signals from said path storing means and for sequentially performing trace-back operations on said m path select signals from a bit corresponding to said starting node number determined by said starting node number deciding circuit, for signal decoding;

wherein:

when m path select signals from said ACS circuit are written into said path storing means while a starting node number is determined by said starting node number deciding circuit, m path select signals, generated prior to said m path select signals, are read out in a sequence opposite to that in which said m select signals were written, and said m path select signals thus read are traced back by said trace-back circuit from a corresponding bit to said starting node number, and

said starting node number deciding circuit being provided with $2^{(K-1)}$ node deciding circuits corresponding to bits of a path select signal, i.e., nodes of said encoder;

each of said $2^{(K-1)}$ node deciding circuits including:

(a) node number calculating means for receiving a corresponding bit of a path select signal applied to said starting node number deciding circuit to the said node deciding circuit and for calculating a node number through which a path, which arrives at a corresponding node to said bit, passed in a path select signal just before said path select signal;

(b) node number storing means for storing a node number;

(c) first selecting means for receiving node numbers stored in said node number storing means of each of said node deciding circuits and for selecting a node number stored in a node number storing means of a node deciding circuit corresponding to a node number calculated by said node number calculating means; and

(d) second selecting means for selecting between a node number calculated by said node number calculating means and a node number selected by said first selecting means for forwarding to said node number storing means;

wherein:

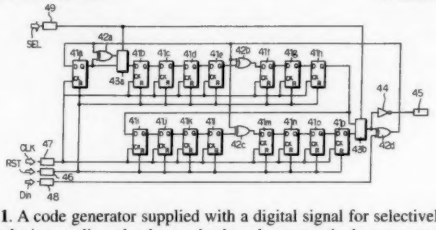
when m path select signals are applied to said starting node number deciding circuit, said second selecting means selects, at the time when the first of said m path select signals is applied, a node number calculated by said node number calculating means while said second selecting means selects, at the time when the second to mth of said m path select signals are applied, a node number selected by said first selecting means, and after the mth of said m path select signals is applied said node number stored in said node number storing means becomes said starting node number.

6,041,434

CODE GENERATOR FOR SELECTIVELY PRODUCING CYCLIC REDUNDANCY CHECK DATA CODES DIFFERENT IN DATA LENGTH

Yoshiyuki Kamishima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1997, Appl. No. 941,320
Claims priority, application Japan, Oct. 9, 1996, 8-268046
Int. Cl.[7] H03M *13/00*
U.S. Cl. 714—807 **13 Claims**



1. A code generator supplied with a digital signal for selectively producing cyclic redundancy check codes respectively representative of cyclic redundancy check values through polynomials different from one another in degree, comprising:

a plurality of flip flop circuits equal in number to the maximum degree of said polynomials, and connected in cascade;

exclusive-OR gate means selectively inserted into the cascade connection of said plurality of flip flop circuits; and

multiplexing means selectively inserted into said cascade connection of said plurality of flip flop circuits, said exclusive-OR gate means and said multiplexing means forming a plurality of data paths selectively used for calculating said cyclic redundancy check values wherein each of said flip flop circuits consists only of a single flip flop.

DESIGNS

MARCH 21, 2000

421,673

CHOCOLATE CONFECTION

Ryan Sherman, and David Ryan, both of Seattle, Wash., assignors to Starbucks Corporation, Seattle, Wash.

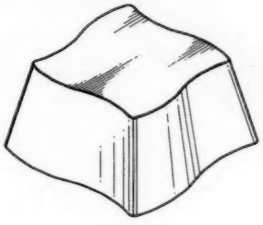
Filed Jan. 29, 1999, Appl. No. 99,972

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 01 - *01*

U.S. Cl. D1—127



421,674

REVERSIBLE SWEATER

Lynn F King, 7700 SR 532, Davenport, Fla. 33837

Filed Apr. 15, 1999, Appl. No. 103,499

Term of patent 14 years

LOC (6) Cl. 02 - *02*

U.S. Cl. D2—750

421,675

HAT DRAPE

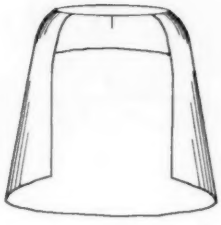
Thomas Edward Phillips, 5379 Peyton Pl., San Diego, Calif. 92117

Filed Jun. 19, 1998, Appl. No. 89,681

Term of patent 14 years

LOC (6) Cl. 02 - *03*

U.S. Cl. D2—891



421,676

INTERLOCKING SANDAL

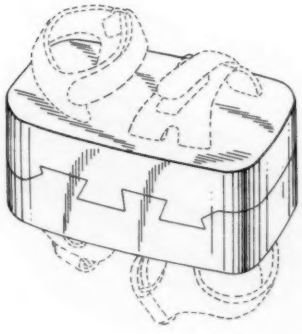
Max Debiase, and Donald R. Wilborn, both of Boca Raton, Fla., assignors to BBC International, Ltd., Boca Raton, Fla.

Filed Nov. 19, 1998, Appl. No. 96,780

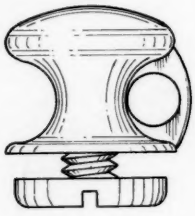
Term of patent 14 years

LOC (6) Cl. 02 - *04*

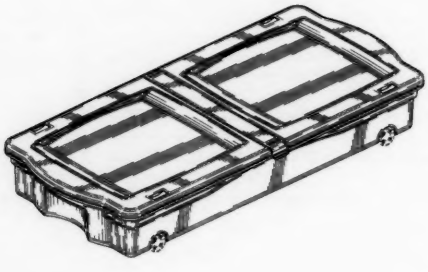
U.S. Cl. D2—897



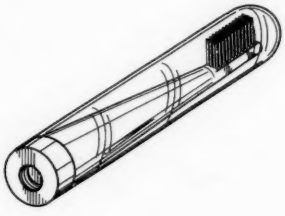
421,677
SHOE STUD
Howard Silagy, 100A Tee St., Hicksville, N.Y. 11801
Filed May 26, 1999, Appl. No. 105,544
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—978



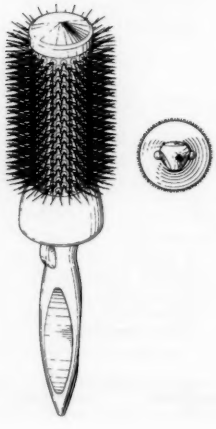
421,678
STORAGE CONTAINER WITH LID
Reginald Levy, Kent, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 5, 1999, Appl. No. 102,965
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—279



421,679
PORTABLE TRAVEL TOOTHBRUSH
Donald M. Armstrong, One Market St., 2nd Floor, Lynn, Mass. 01901
Filed Jun. 16, 1999, Appl. No. 106,628
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—108



421,680
HAIRBRUSH
John Charles Worthington, London, United Kingdom, assignor to Charles Worthington Hair Accessories Unlimited, London, United Kingdom
Filed Aug. 26, 1997, Appl. No. 75,820
Claims priority, application United Kingdom, Feb. 26, 1997, 2063592
Term of patent 14 years
LOC (6) Cl. 04 - *02*
U.S. Cl. D4—128



421,681

BROOM SHROUD

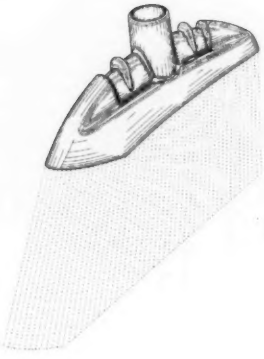
John D. Breen, Piqua, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 3, 1997, Appl. No. 81,173

Term of patent 14 years

LOC (6) Cl. 04 - *99*

U.S. Cl. D4—199



421,682

PICTURE FRAME

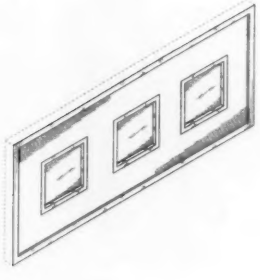
Paul Rowan, 2358 Midland Ave., Toronto, Ontario, Canada, M1S 1P8

Filed Oct. 22, 1999, Appl. No. 112,626

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—301



421,683

APPAREL DESIGNATOR

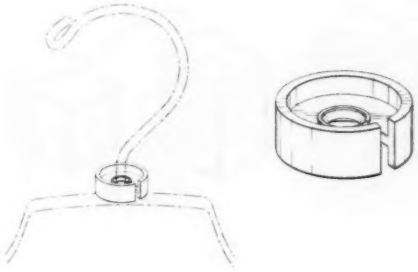
Donald J. Willardson, Provo, Utah, assignor to DBW Marketing, Inc., Provo, Utah

Filed Apr. 16, 1999, Appl. No. 103,586

Term of patent 14 years

LOC (6) Cl. 06 - *08*

U.S. Cl. D6—328



421,684

SLING CHAIR

Gregory M. Saul, Charlotte, N.C., assignor to Chromcraft/Revington Company, Senatobia, Miss.

Filed May 11, 1999, Appl. No. 104,727

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—373

421,685

STORAGE CABINET

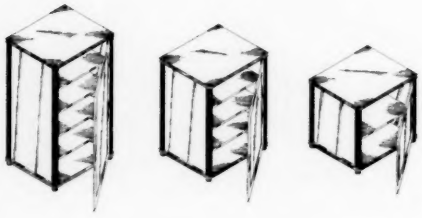
Salvatore R. Carrabba, 32 Hillsboro Dr., West Hartford, Conn. 06107

Filed Sep. 16, 1998, Appl. No. 93,679

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—432



421,686

CLOTHES HANGER HOLDER

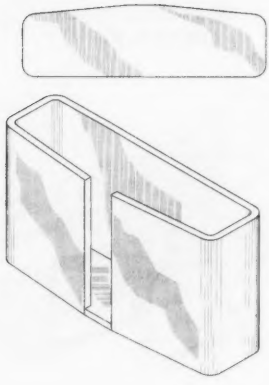
Allan Wacks, 60 Penfields House, Yorkway Est. Yorkway, London N7 9QA, United Kingdom

Filed May 13, 1999, Appl. No. 104,842

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—466



421,687

DISPLAY CASE

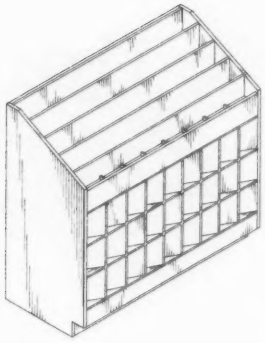
James P. Curci, 117 Tripp St., Fall River, Mass. 02724

Filed Jun. 9, 1999, Appl. No. 106,060

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—473



421,688

METAL FURNITURE TUBING

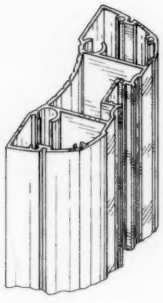
Galen C. Doud, Kent; Cory J. Sytsma, Bellevue, and Paul M. Chen, Seattle, all of Wash., assignors to HON Technology Inc., Muscatine, Iowa

Filed Aug. 14, 1998, Appl. No. 92,270

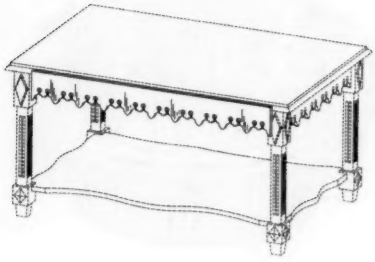
Term of patent 14 years

LOC (6) Cl. 06 - *06*

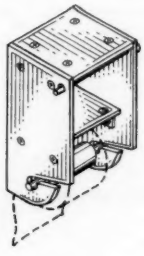
U.S. Cl. D6—491



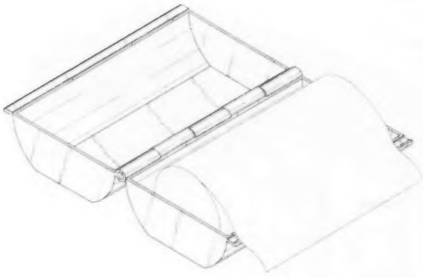
421,689
FURNITURE PANEL
Sahara-A. Gesing, 2510 Valencia Ter., Charlotte, N.C. 28226
Division of application No. 29/078,024, Oct. 15, 1997, Pat. No. Des. 415,633. This application May 17, 1999, Appl. No. 105,064.
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—491



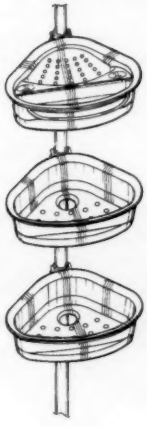
421,690
TOILET PAPER HOLDER
Leonard W. Sutherland, 3044 W. Windrose Dr., Phoenix, Ariz. 85029-1329
Filed Mar. 5, 1999, Appl. No. 101,492
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—520



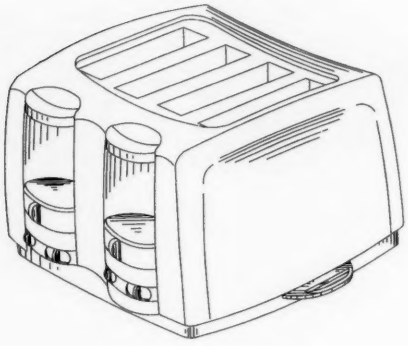
421,691
ROLL CONTAINER AND DISPENSER
Jani C. Hoblitz, Fredericksburg, Va., assignor to Janie C Hoblitz, Fredericksburg, Va.
Filed Apr. 24, 1998, Appl. No. 86,999
Term of patent 14 years
LOC (6) Cl. 06 - *02*
U.S. Cl. D6—522



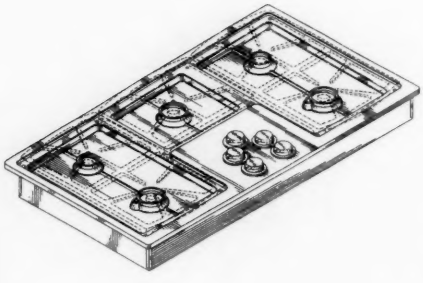
421,692
POLE CADDY
Paul Wojtowicz, Downingtown, Pa., and James A. Hofman, Hockessin, Del., assignors to Zenith Products Corp., New Castle, Del.
Filed Apr. 29, 1999, Appl. No. 104,148
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—525



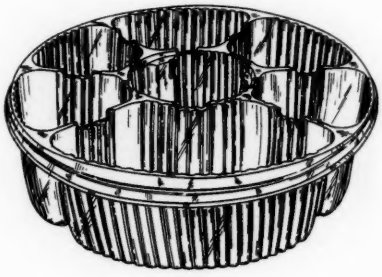
421,693
TOASTER
Richard J. Carbone, Sterling, Mass., assignor to HP Intellectual Corp., Wilmington, Del.
Division of application No. 29/082,825, Jan. 9, 1998. This application Jul. 20, 1999, Appl. No. 108,114.
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—330



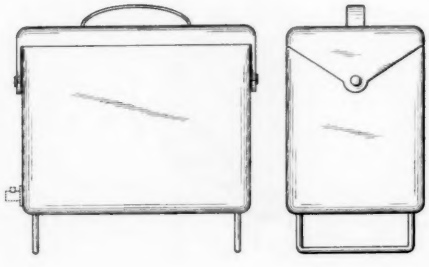
421,694
GAS COOKTOP
Joey Kitabayashi, La Mirada; Robert A. Lewis, Alta Loma; Michael Markowich, Upland, all of Calif., and Carl H. Adams, Paradise Valley, Ariz., assignors to Distinctive Appliances, Inc., Pasadena, Calif.
Filed Apr. 17, 1998, Appl. No. 86,668
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—346



421,695
VEGETABLE CONTAINER
Calvin S. Krupa, Medina, and Robert Knoss, Anoka, both of Minn., assignors to Ultra Pac, Inc., Rogers, Minn.
Filed Mar. 6, 1998, Appl. No. 84,690
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—557



421,696
BEVERAGE COOLER
Lisa A Hendrix, 2 Guilford Green Ct., Columbia, S.C. 29212
Filed Apr. 29, 1999, Appl. No. 104,198
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D7—605



421,697

COASTER

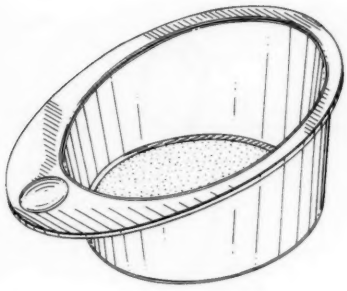
Fred Hollinger, Kings Park, N.Y., assignor to E & B Giftware, Inc., Yonkers, N.Y.

Filed Jun. 16, 1999, Appl. No. 106,426

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—624



421,698

ZESTER/SCORER TOOL

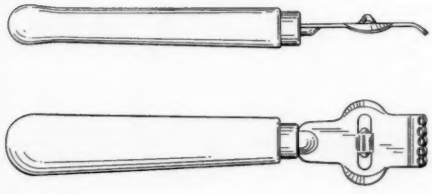
Nigel Wang, Taipei, Taiwan, assignor to The Pampered Chef, Ltd., Addison, Ill.

Filed Feb. 27, 1998, Appl. No. 84,276

Term of patent 14 years

LOC (6) Cl. 07 - *04*

U.S. Cl. D7—693



421,699

PRUNING SHEARS

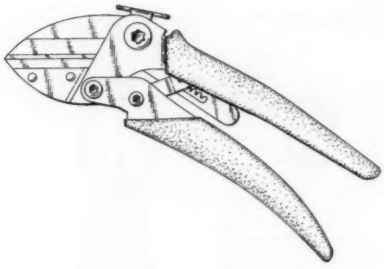
Sean E. Florian, Southington, Conn., assignor to American Standard Company, Southington, Conn.

Filed May 4, 1999, Appl. No. 104,406

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—4



421,700

HEDGE TRIMMER

Yoshiro Yamane, Akashi, and Tadao Yashirodai, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

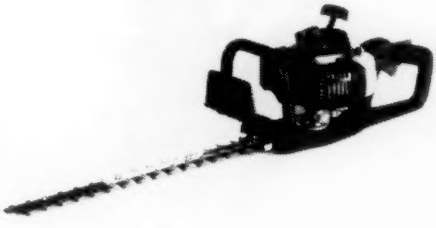
Filed Dec. 21, 1998, Appl. No. 98,173

Claims priority, application Japan, Jul. 24, 1998, 10-21381

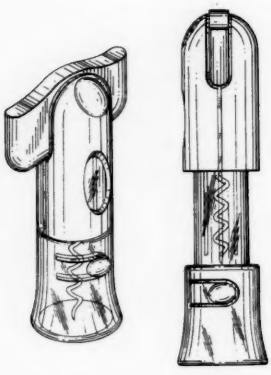
Term of patent 14 years

LOC (6) Cl. 08 - *01*

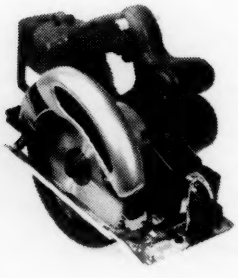
U.S. Cl. D8—8



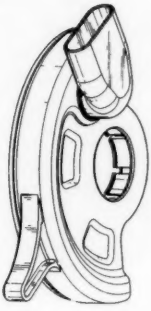
421,701
WINE CORK PULLER
Fred Hollinger, Kings Park, N.Y., assignor to E & B Giftware, Inc., Yonkers, N.Y.
Filed Jun. 16, 1999, Appl. No. 106,418
Term of patent 14 years
LOC (6) Cl. 07 - *06*
U.S. Cl. D8—42



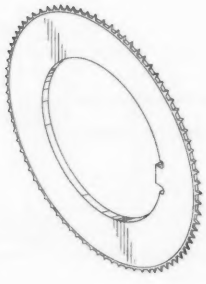
421,702
PORTABLE ELECTRIC CIRCULAR SAW
Masato Sakai, and Akira Onose, both of Hitachinaka, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed Dec. 10, 1998, Appl. No. 97,605
Claims priority, application Japan, Jun. 26, 1998, 10-18565
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—66



421,703
COVER WITH EXHAUSTING ATTACHMENT FOR ENGINE DRIVEN HAND TOOL
Bjarne Isaksen, Alings, Sweden, assignor to ToolBox Woodworking Sweden AB, Alingsås, Sweden
Filed Sep. 14, 1998, Appl. No. 93,570
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—70

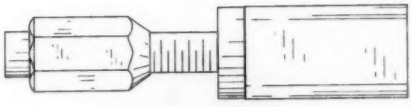


421,704
SPIKED FEEDING WHEEL FOR USE IN A BOARD SPLITTING APPARATUS
Katsuji Hasegawa, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi-ken, Japan
Filed Dec. 11, 1998, Appl. No. 97,668
Claims priority, application Japan, Jun. 26, 1998, 10-18579; Jun. 26, 1998, 10-18580
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—70

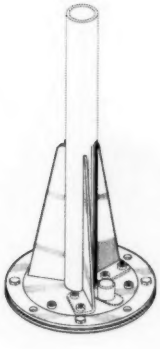


421,705
SCREWDRIVER
Harlan R. Smith, 107 Beach St., Marlborough, Mass. 01752
Filed Dec. 16, 1998, Appl. No. 97,870
Term of patent 14 years
LOC (6) Cl. 08 - *04*
U.S. Cl. D8—83

421,707
SPARE TIRE SECURITY LOCK
Edwin H. Gregory, 712 Arkansas Ave., Mountain Home, Ark. 72653
Filed Dec. 4, 1998, Appl. No. 97,364
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—341



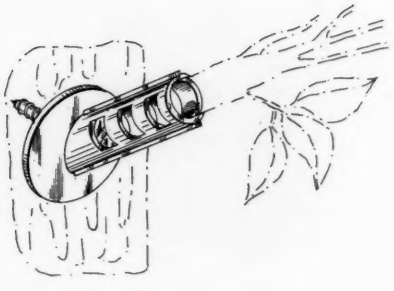
421,708
QUICK RELEASE POST BASE
Gerry Kuhnke, Plover, Wis., assignor to Gamber Johnson, Stevens Point, Wis.
Division of application No. 29/097,917, Dec. 17, 1998. This application Mar. 4, 1999, Appl. No. 101,477.
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—349



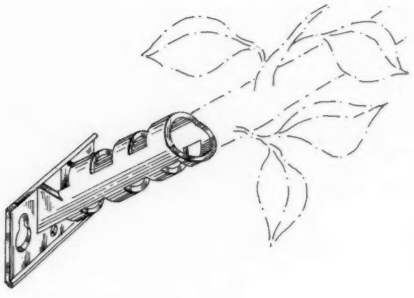
421,706
KNIFE SHARPENER
Mathieu Lion, 29 avenue du Maréchal Leclerc, Malakoff, France, 92240, and Lucas Bignon, 5 rue Fizeau, Suresnes, France, 92150
Filed Apr. 2, 1998, Appl. No. 86,000
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—91

421,709
TOWER CHAIR
Dale Haslem, Canyon Lake; G. Douglas Hartzheim, Fontana; Steve Wilbur, Chino, and Marty Lancial, San Bernardino, all of Calif., assignors to Aztec Concrete Accessories, Inc., Fontana, Calif.
Filed Oct. 2, 1998, Appl. No. 94,467
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—354

421,710
SCREW-IN BRANCH HOLDING BRACKET
Michael L. Hajek, 26555 130th St., Staples, Minn. 56479
Filed Jan. 19, 1999, Appl. No. 99,292
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—363



421,711
BRANCH HOLDING BRACKET
Michael L. Hajek, 26555 130th St., Staples, Minn. 56479
Filed Jan. 19, 1999, Appl. No. 99,302
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—363



421,712
ORNAMENTAL HOOK
John P. Brown, and Susan E. Brown, both of P.O. Box 503, Simsbury, Conn. 06070
Filed Dec. 29, 1998, Appl. No. 98,407
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—370

421,713

OVER THE DOOR DOUBLE HOOK

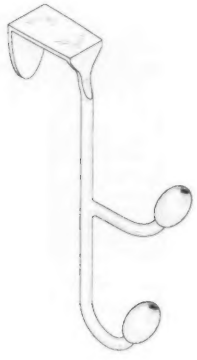
Russell Benton Snell, Shaker Heights, Ohio, assignor to Inter-Design, Inc., Solon, Ohio

Filed Jul. 12, 1999, Appl. No. 107,792

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—372



421,714

CATCH

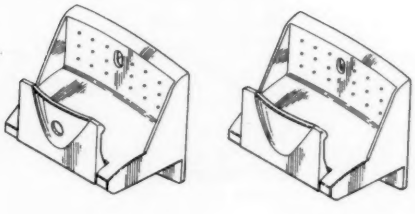
Jerry Moscovitch, 59 Cowan Avenue, Toronto, Ontario, Canada, M6K 2N1, and Tri N'Guyen, Nepean, Canada, assignors to Jerry Moscovitch, Toronto, Canada

Filed Jul. 10, 1998, Appl. No. 90,531

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—373



421,715

HOLDING CLAMP FOR THE WIRES OF A SOCKET

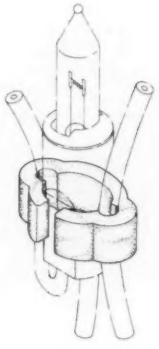
Jen-Chen Won, P.O. Box 96-405, Taipei 106, Taiwan

Filed Jun. 24, 1999, Appl. No. 107,086

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D8—395



421,716

FINGERNAIL POLISH BOTTLE

Len Indelicato, 18080 Boris Ave., Encino, Calif. 91436, and George H. Carroll, 3033 Grove Ave., Ventura, Calif. 93003

Filed Feb. 4, 1999, Appl. No. 100,045

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—318

421,717

PUMP SPRAY BOTTLE

Elaine Litchfield, 45325 Panorama Dr. #9, Palm Desert, Calif. 92260

Filed Jul. 1, 1999, Appl. No. 107,342

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—335

421,718

PORTION OF A TRIGGER FOR TRIGGER PUMP DISPENSER

Leonaora M. Durliat, Toledo, Ohio, and Alan N. Bodker, Wayne, N.J., assignors to Owens-Illinois Closure Inc., Toledo, Ohio

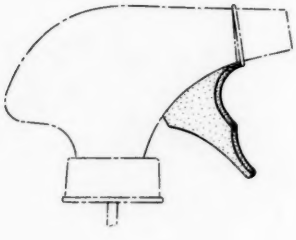
Filed Aug. 11, 1998, Appl. No. 92,026

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—434



421,719

CAP FOR A CONTAINER

Martin Leslie Wells, Lowestoft, and Steed John Hubbard, Bungay, both of United Kingdom, assignors to Midland Cosmetic Sales PLC, Birmingham, United Kingdom

Filed Mar. 3, 1999, Appl. No. 101,649

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—438

421,720

CONTAINER

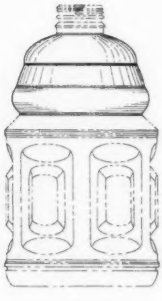
Theodore F. Eberle, Chicago; Jizu J. Cheng, Burr Ridge; Richard G. Kraft, Joilet, all of Ill., and Charles M. Brandt, Lithia Springs, Ga., assignors to Crown Cork & Seal Technologies Corporation, Alsip, Ill.

Filed May 1, 1998, Appl. No. 87,361

Term of patent 14 years

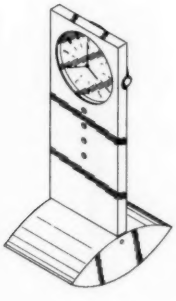
LOC (6) Cl. 09 - *01*

U.S. Cl. D9—500



421,721
BOTTLE
Gilles Guertin, Rougemont, Canada, assignor to Industries Lassonde Inc, Rougemont, Canada
Filed Jun. 29, 1999, Appl. No. 107,043
Claims priority, application Canada, Apr. 21, 1999, 1999-1141
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—520

421,722
ROCKING CLOCK
Eddie Chang, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Man Nin Shing Company Limited, Hong Kong, The Hong Kong Special Administrative Region of the People's Republic of China
Filed May 19, 1999, Appl. No. 105,174
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—26



421,723
WATCH CASING AND BEZEL
Aurelie E. Krauss, Danbury, and John T. Houlihan, Southbury, both of Conn., assignors to Timex Corporation, Middlebury, Conn.
Filed Dec. 17, 1998, Appl. No. 97,931
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

421,724
WATCH CASE
Jean-Pierre Chodat, Auvernier, Switzerland, assignor to Ebel S.A., La Chaux-De-Fonds, Switzerland
Filed Jul. 15, 1999, Appl. No. 107,883
Claims priority, application Hague Agreement, Feb. 8, 1999, DMA/004377
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

421,725

WATCH

Kazuo Iwanaga, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

Filed Sep. 25, 1998, Appl. No. 94,143

Claims priority, application Japan, Mar. 26, 1998, 10-8466

Term of patent 14 years

LOC (6) Cl. 10 - *02*

U.S. Cl. D10—32

421,726

COMBINED LENS FOR CLEARANCE SIDEMARKER AND IDENTIFICATION LAMP

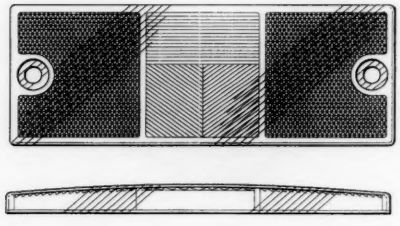
Yubo Yang, North Brunswick; Chenhua You, Spring Lake Heights, and Rand J. Eikelberger, Allenwood, all of N.J., assignors to Dialight Corporation, Manasquan, N.J.

Division of application No. 29/048,703, Jan. 11, 1996, Pat. No. Des. 397,633. This application Nov. 12, 1997, Appl. No. 79,757.

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—111



421,727

DOORBELL BUTTON

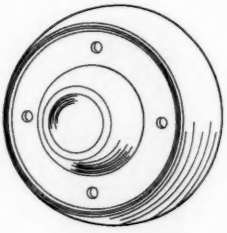
Theodore Pierson, and Thomas Gordon, both of P.O. Box 4758, Seattle, Wash. 98104

Filed May 11, 1999, Appl. No. 104,707

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—116



421,728

VAGINAL JEWELRY

James G. S. Sutton, 804 S. Federal Hwy., Hallandale, Fla. 33009

Continuation-in-part of application No. 29/084,671, Mar. 7, 1998. This application Nov. 23, 1998, Appl. No. 96,926.

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—56

421,729

FLOWER POT COVER

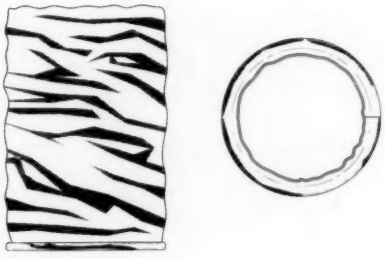
Bethann Sedora, and Mark Sedora, both of 4806 Fawn Ct., New Tripoli, Pa. 18066

Filed Apr. 17, 1997, Appl. No. 69,810

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



421,730

RIGID FLAG

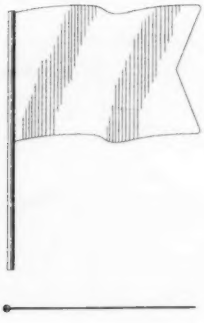
Dan Vance, 8948 SW. Barbur Blvd., #150, Portland, Oreg. 97219-4047

Filed Jun. 15, 1999, Appl. No. 106,588

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D11—166



421,731

TIRE TREAD

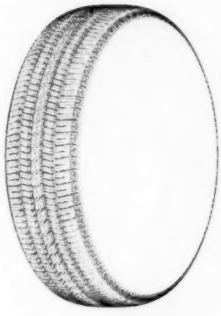
Michael Joseph Weber, Mogadore, Ohio, and Kevin Alan Reid, Asheville, N.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 30, 1999, Appl. No. 102,740

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—146



421,732

TIRE TREAD

Anthony John Fierro, Uniontown; Kurt Jon Bergstrom, Tallmadge; Kevin Christopher Legge, Uniontown; David Allen Griffin, and Jeffrey Leon Sevart, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1999, Appl. No. 105,681

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—146

421,733

TIRE TREAD

James G. Guspodin, Akron; Richard J. Wright, Copley, and John J. Regallis, Akron, all of Ohio, assignors to Bridgestone/Firestone, Research, Inc., Akron, Ohio

Filed Feb. 12, 1999, Appl. No. 100,568

Term of patent 14 years

LOC (6) Cl. 12 - *15*

U.S. Cl. D12—147

421,734

EXTERIOR SURFACE CONFIGURATION OF A GRILL FOR A VEHICLE

Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to DaimlerChrysler AG

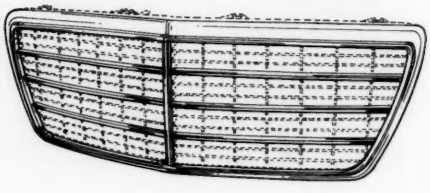
Filed May 25, 1999, Appl. No. 105,431

Claims priority, application Germany, Nov. 25, 1998, 498 11 626

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—163



421,735

ALL TERRAIN WHEEL FOR A WHEELCHAIR

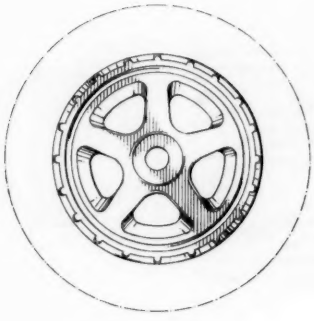
Brian Gagnon, 4311 NW. 64th Ave., Coral Springs, Fla. 33067

Filed Jan. 14, 1998, Appl. No. 82,069

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



421,736

PICK-UP TRUCK LIGHTWEIGHT CARGO COVER

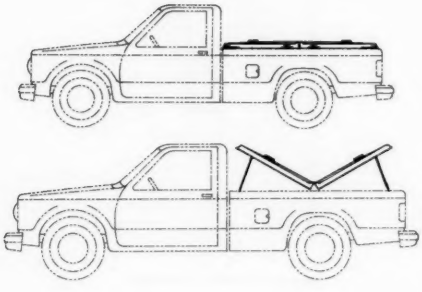
Donald E. Bogard, 22204 Dolphin Ct., Dearborn Heights, Mich. 48127

Filed Apr. 26, 1999, Appl. No. 103,919

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—401



421,737

REAR CARRIER FOR AN OFF-ROAD VEHICLE

Hideyoshi Kosuge, Kakogawa; Takeshi Usui, Takasago; Kazuhiro Maeda, Akashi; Jiro Kitao, Kobe; Kazumasa Hisada, Akashi; Teruhito Momoi, Akashi, and Naoki Hashimoto, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

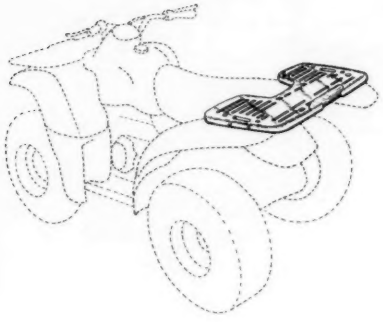
Filed Oct. 28, 1998, Appl. No. 95,659

Claims priority, application Japan, Apr. 28, 1998, 10-12334

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—407



421,738

SPORTING GOODS INSERT FOR PICKUP STORAGE COMPARTMENT

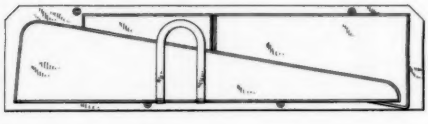
Stuart W. Gribble, 8253 Oxford Ct., Wichita, Kans. 67226, and Robert T. Hoffmann, 1220 Burning Tree Dr., Wichita, Kans. 67230

Filed Jul. 6, 1998, Appl. No. 90,288

Term of patent 14 years

LOC (6) Cl. 12 - *99*

U.S. Cl. D12—414.1



421,739

BATTERY LIFT HANDLE

Rodney Ivan Arthur, South Australia, Australia, assignor to Rope & Plastic Products Pty Ltd., South Australia, Australia

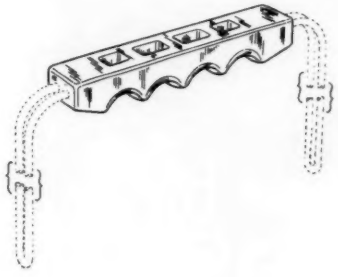
Filed Oct. 19, 1998, Appl. No. 95,224

Claims priority, application Australia, Apr. 17, 1998, 1079/1998

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—119



421,740

BATTERY CLAMP

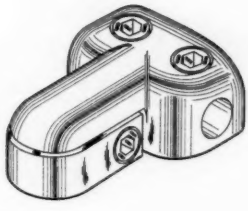
Keith A. Peterson, and Yasu Yamamoto, both of Portland, Oreg., assignors to Phoenix Gold International, Inc., Portland, Oreg.

Filed Nov. 2, 1998, Appl. No. 96,751

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—120



421,741

SURGE PROTECTOR

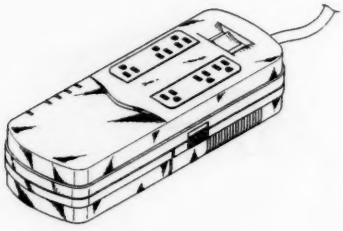
Ming Yu Lien, Hsin Tien, Taiwan, assignor to Sysgration Ltd., Taipei, Taiwan

Filed Jan. 6, 1999, Appl. No. 98,871

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—139.8



421,742

JACK (OR PROTECTOR) FOR FEMALE CONNECTOR

Yoshikazu Katoh, Tokyo, Japan, assignor to Honda Tsushin Kogyo Co., Ltd., Tokyo, Japan

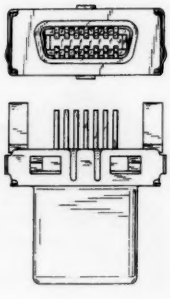
Filed Sep. 30, 1998, Appl. No. 94,336

Claims priority, application Japan, Mar. 31, 1998, 10-8918

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—147



421,743

LENS FOR SEMICONDUCTOR ELEMENT

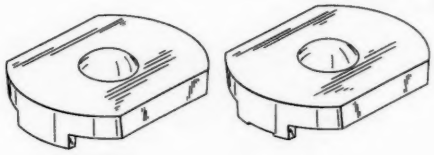
Kazuhiko Ueda, and Michio Koyama, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1997, Appl. No. 69,058

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—182



421,744

ELECTRONIC CALCULATOR HAVING THE FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK, CALENDAR, SCHEDULE BOOK AND MEMO BOOK

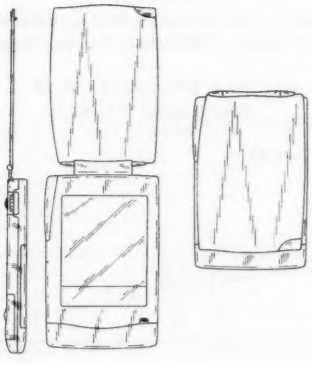
Junichi Ono, Kawasaki, Japan, assignor to Casio Keisanki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1999, Appl. No. 105,031

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100



421,745

IMAGE SCANNER

Shinsuke Fujiwara; Satoru Takagi; Makoto Someya, all of Osaka-fu, and Masakatsu Takizawa, Tokyo, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 8, 1999, Appl. No. 103,088

Claims priority, application Japan, Oct. 13, 1998, 10-29519

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107

421,746

SCANNER BODY AND SCANNER COVER FRONT END PORTION

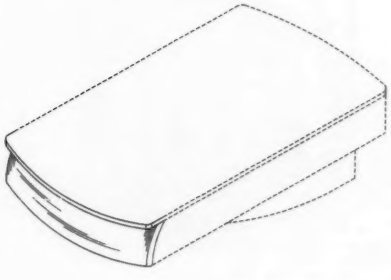
Modest Khovaylo, and James C. Dow, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of application No. 29/100,743, Feb. 17, 1999, which is a division of application No. 29/094,295, Sep. 29, 1998, Pat. No. Des. 410,444, which is a division of application No. 29/075,936, Aug. 28, 1997. This application Jul. 12, 1999, Appl. No. 107,788.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107



421,747

IMAGE DISPLAY APPARATUS

Sakiko Takizawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

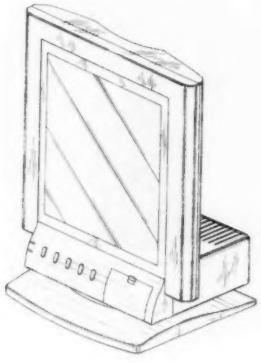
Filed Jan. 21, 1999, Appl. No. 99,418

Claims priority, application Japan, Jul. 22, 1998, 10-021003

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—113



421,748

STORAGE DISK CARTRIDGE

Wayne A. Sumner, Ogden; David W. Griffith; Allen T. Bracken, both of Layton, all of Utah; Nicholas Brawne, San Francisco, and T. Greg Nguyen, San Jose, both of Calif., assignors to Iomega Corporation, Roy, Utah

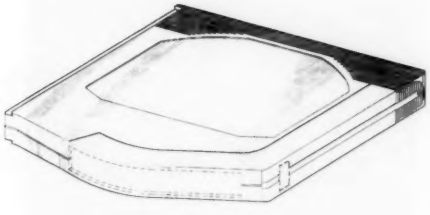
Filed Oct. 27, 1997, Appl. No. 78,503

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114



421,749

ICON FOR A DISPLAY SCREEN

Parichay Saxena, Milpitas; Sheng Dong, Fremont, and Alexandra Nsonwu, San Jose, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Oct. 23, 1998, Appl. No. 95,448

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.7

421,750

KEYBOARD

Tsui-Jong Su, Taipei Hsien, Taiwan, assignor to Shin Jiuh Corporation, Hsin-Tien, Taiwan

Filed Apr. 5, 1999, Appl. No. 102,906

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—115

421,751

TELEPHONE

Raymond Chan, Woodland Heights, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to IDT Communication Technology Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China

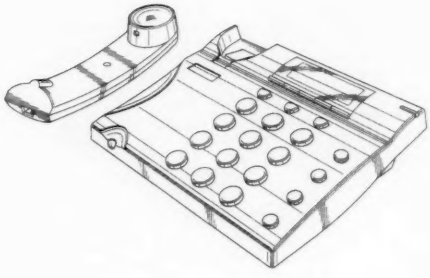
Filed May 12, 1999, Appl. No. 104,912

Claims priority, application The Hong Kong Special Administrative Region of the People's Republic of China, Apr. 1, 1999, 9910383

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—151



421,752

PORTABLE CD-PLAYER

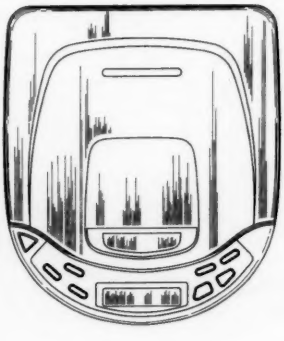
Josh Zeitman, Brooklyn, N.Y., assignor to Lenoxx Electronics Corp., Brooklyn, N.Y.

Filed Sep. 2, 1998, Appl. No. 93,078

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—156



421,753

TAPE PLAYER

Daisuke Ishii, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of application No. 29/065,287, Jan. 31, 1997, abandoned, application No. 29/065,286, Jan. 31, 1997, abandoned, and application No. 29/065,282, Jan. 31, 1997, abandoned. This application Oct. 10, 1997, Appl. No. 77,875.

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—165

421,754

SPEAKER BOX

Masafumi Ito, and Shigeru Hasegawa, both of Musashino, Japan, assignors to Teac Corporation, Musashino, Japan

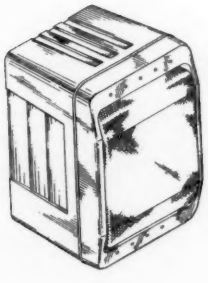
Filed Jun. 1, 1999, Appl. No. 105,841

Claims priority, application Japan, Dec. 3, 1998, 10-035054

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—214



421,755

TELEPHONE HEADSET EAR HOOK

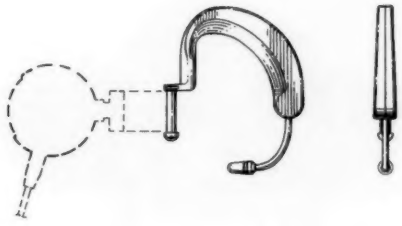
Matthew Pitel, Rogers, Minn., assignor to Unicon Incorporated, Minneapolis, Minn.

Filed Feb. 17, 1999, Appl. No. 100,711

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—240



421,756

HAND-GRIP CORDLESS INFLATOR

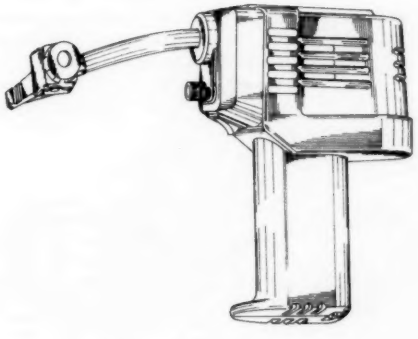
Robert L. Bonzer, 905 W. Amity Rd., Boise, Id. 83705

Filed Jul. 23, 1999, Appl. No. 108,324

Term of patent 14 years

LOC (6) Cl. 15 - *02*

U.S. Cl. D15—7



421,757

REFRIGERATOR DISPLAY UNIT

Osvaldo Felix Volonterio, 12 de Octubre 5726, -7600, Mar del Plata, Buenos Aires, Argentina

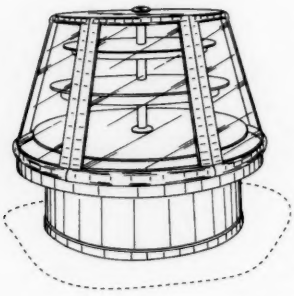
Filed Jan. 19, 1999, Appl. No. 99,328

Claims priority, application Argentina, Jul. 20, 1998, 65915

Term of patent 14 years

LOC (6) Cl. 15 - *07*

U.S. Cl. D15—81



421,758

HANDLE BREAK PROTECTOR

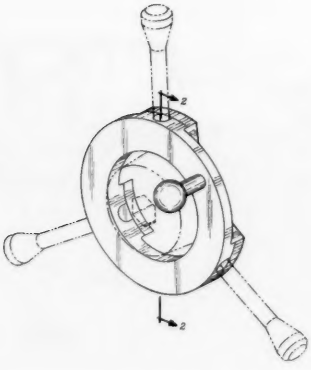
Faramarz Khaladj; Farhad Khalaj, and Steve Khalaj, all of 23161 Peralta Dr., Laguna Hills, Calif. 92653

Filed Jul. 14, 1999, Appl. No. 107,836

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—142



421,759

WARMING TRAY FOR GLUE HEATING CARTRIDGES

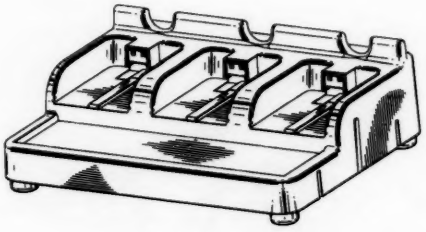
George Maayeh; Elias S. Maayeh, both of 2311 Chimney Hill Ct., Arlington, Tex. 76012, and Les Bokros, 8632 Timber Dr., Fort Worth, Tex. 76180

Filed Jan. 29, 1999, Appl. No. 99,857

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—150



421,760

BINOCULAR HOOD

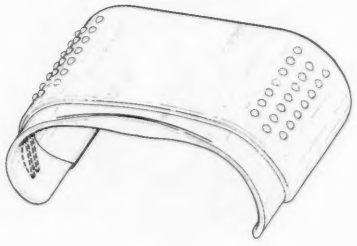
John E. Fleck, 33527 5th Pl. SW., Federal Way, Wash. 98023, assignor to John E. Fleck, Federal Way, Wash.

Continuation-in-part of application No. 29/094,418, Sep. 30, 1998, Pat. No. Des. 410,242, which is a continuation-in-part of application No. 29/088,542, May 27, 1998, Pat. No. Des. 409,638. This application Apr. 29, 1999, Appl. No. 104,178.

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—133



421,761

CAMERA

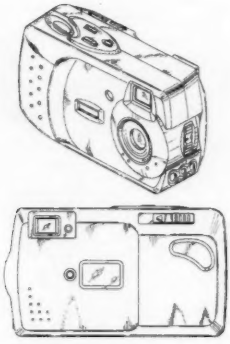
Chih-Hung Chang, Taichung, and Wen-Tsung Wang, Taichung Hsien, both of Taiwan, assignors to Largan Digital Co., Ltd., Taichung, Taiwan

Filed Jun. 29, 1999, Appl. No. 107,051

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—209



421,762

PUCK SHAPED TRANSPARENCY VIEWER

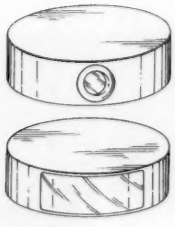
Brian E. Shirley; Brian T. Eichelberger, and Margaret A. Craig, all of Scottsdale, Ariz., assignors to Insight Imaging, Inc., Scottsdale, Ariz.

Filed Oct. 13, 1998, Appl. No. 94,916

Term of patent 14 years

LOC (6) Cl. 16 - *02*

U.S. Cl. D16—227



421,763

SPECTACLES

Colin Pickering, Puttenham, and James Barnaville, Farnham, both of United Kingdom, assignors to Inline UK Limited, Ockley, United Kingdom

Filed Nov. 19, 1998, Appl. No. 96,754

Claims priority, application United Kingdom, May 20, 1998, 2074811

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—326

421,764

EYEWEAR FRONT

Kip Arnette, South Laguna Beach, Calif., assignor to Luxottica Leasing S.p.A., Agordo, Italy

Division of application No. 29/080,482, Dec. 10, 1997, Pat. No. Des. 411,560. This application Apr. 5, 1999, Appl. No. 102,934.

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—326

421,765

GLASSES

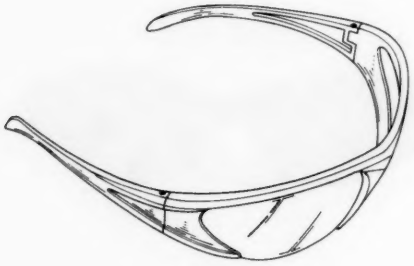
Wen-Hsing Hsu, 7th Fl., No. 50, Sec. 2, Chang-An E. Rd., Taipei, Taiwan

Filed Sep. 9, 1999, Appl. No. 110,585

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—326



421,766

HEAD FOR STRINGED INSTRUMENTS

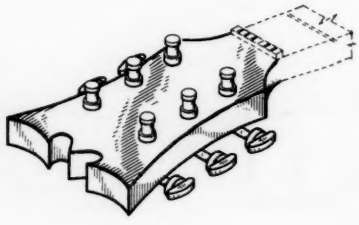
Eric A. Deyoe, 80 S. Broadway, Apt. #8, Denver, Colo. 80209

Filed Jan. 28, 1999, Appl. No. 99,762

Term of patent 14 years

LOC (6) Cl. 17 - *03*

U.S. Cl. D17—20



421,767

PHOTOCOPIER

Takashi Kusanagi, Akishima, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

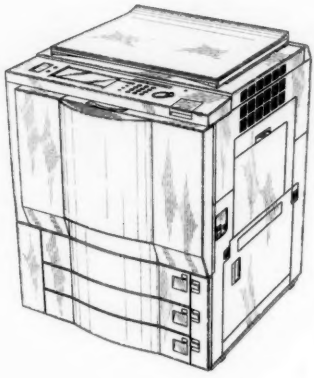
Filed Apr. 27, 1999, Appl. No. 104,022

Claims priority, application Japan, Oct. 28, 1998, 10-31295

Term of patent 14 years

LOC (6) Cl. 16 - *03*

U.S. Cl. D18—39



421,768

PRINTER

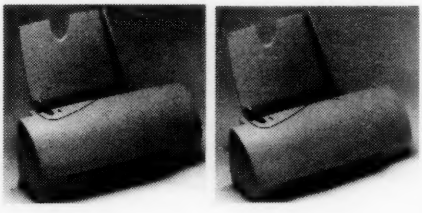
Dwight Nelson Blair, Suwanee, Ga., and Thomas Eugene Pangburn, Lexington, Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed May 22, 1998, Appl. No. 88,447

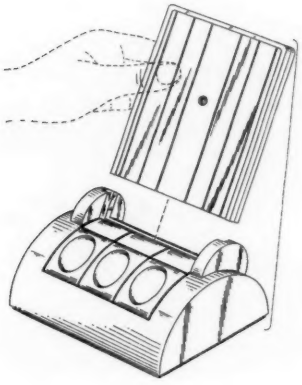
Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D18—50

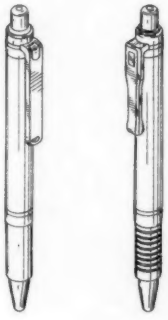


421,769
PRINTER CONTROL DEVICE
Paul T. Dubson, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 6, 1995, Appl. No. 35,691
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 18 - *02*
U.S. Cl. D18—56



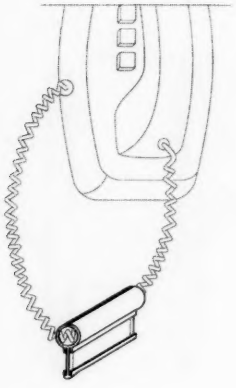
421,770
MECHANICAL PENCIL
Tsukasa Sasaki, Misato, Japan, assignor to Pentel Kabushiki Kaisha, Japan
Filed Dec. 1, 1997, Appl. No. 80,141
Claims priority, application Japan, May 30, 1997, 9-56292
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—48

421,771
WRITING INSTRUMENT
Giovanni Avenatti, Settino Torinese, Italy, assignor to Stilolinea S.r.l., San Mauro Torinese, Italy
Filed May 4, 1999, Appl. No. 104,385
Claims priority, application Italy, Nov. 16, 1998, T980298
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—48



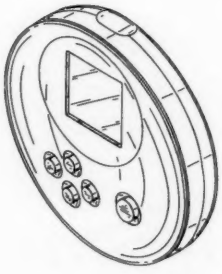
421,772
MECHANICAL PENCIL
Shigeki Maruyama, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan
Filed Apr. 16, 1999, Appl. No. 103,570
Claims priority, application Japan, Oct. 19, 1998, 10-30234
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—51

421,773
INFORMATION DISPLAY HOLDER FOR TELEPHONE CORD
Nasser Yashar, 1133 Meadow La. #100, Concord, Calif. 94520
Filed Apr. 24, 1995, Appl. No. 35,470
Term of patent 14 years
LOC (6) Cl. 20 - *99*
U.S. Cl. D20—42

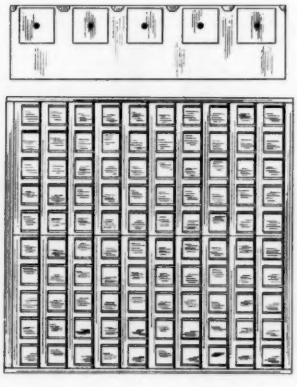


421,774
GAME MACHINE
Ryosuke Toriyama, Yokohama, Japan, assignor to Konami Co., Ltd., Hyogo-ken, Japan
Filed Mar. 8, 1999, Appl. No. 101,625
Claims priority, application Japan, Sep. 16, 1998, 10-26535
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—325

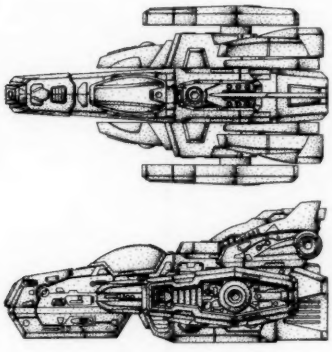
421,775
GAME MACHINE
Teiyu Goto, Tokyo, Japan, assignor to Sony Computer Entertainment Inc., Tokyo, Japan
Filed Jan. 28, 1999, Appl. No. 99,766
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—329



421,776
WORD FORMATION GAME
Chris Alan Borg, 720 14th St., Huntington Beach, Calif. 92648
Filed Feb. 8, 1999, Appl. No. 100,281
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—336



421,777
TOY SPACECRAFT
Kam Wah Wei, Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China, assignor to Wah Hing Toys Development Co., Ltd., Kowloon, The Hong Kong Special Administrative Region of the People's Republic of China
Filed Mar. 16, 1999, Appl. No. 102,020
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—451



421,778
DOLL
Brian K. Waggoner, 523 Long Rd., New Florence, Mo. 63363
Filed Jul. 24, 1997, Appl. No. 74,565
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—630

421,779
TREADMILL-TYPE EXERCISE APPARATUS
Gary D. Piaget, 3390 American Saddler Dr., Park City, Utah 84060, and Jeffrey S. Heaton, 668 Tenth Ave., Kirkland, Wash. 98033
Filed Nov. 1, 1996, Appl. No. 61,891
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—669

421,780
COVER FOR GOLF CLUB HEADS
David M. Whitesides, Marshville, N.C., assignor to Devant, Ltd., Monroe, N.C.
Filed Nov. 19, 1998, Appl. No. 96,768
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—754

421,781
GOLF CLUB HEAD COVER
Caryl A. Somers, 3804 N. Colorado, Florence, Ariz. 85232
Filed Nov. 23, 1998, Appl. No. 96,893
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—754

421,782
HOCKEY STICK SHAFT
Suk-Ho Ryu, Seoul, Rep. of Korea, assignor to Wavex Corporation, Toronto, Canada
Filed Sep. 28, 1998, Appl. No. 94,189
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—757

421,783
GOLF CLUB SHAFT
Suk-Ho Ryu, Seoul, Rep. of Korea, assignor to Wavex Corporation, Toronto, Canada
Continuation of application No. PCT/US97/21832, Nov. 26, 1997, and a continuation-in-part of application No. 29/061,700, Oct. 29, 1996, Pat. No. Des. 401,981, and a continuation of application No. 08/896,722, Jul. 18, 1997, abandoned, which is a continuation-in-part of application No. 08/760,079, Dec. 4, 1996, abandoned, Provisional application No. 60/047,697, May 23, 1997. This application Nov. 25, 1998, Appl. No. 97,068.
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—757

421,784
CAVITY INSERT FOR A GOLF IRON HEAD
Daniel J. Kubica, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.
Division of application No. 29/089,352, Jun. 11, 1998. This application Apr. 23, 1999, Appl. No. 103,886.
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—759

421,785

GUN SIGHT

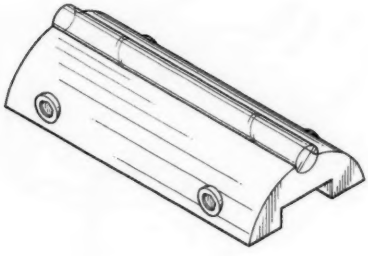
Julius H. Uhlmann, Huntsville, and Paul A. Flubacher, Greenville, both of Ala., assignors to REF Alabama Inc., Greenville, Ala.

Filed Mar. 11, 1998, Appl. No. 84,843

Term of patent 14 years

LOC (6) Cl. 22 - *01*

U.S. Cl. D22—109



421,786

AREA FILTER DEVICE

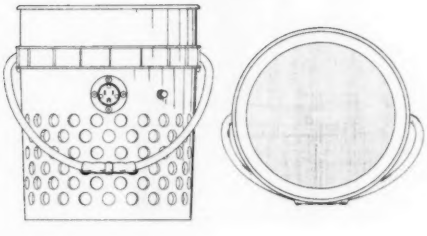
Raoul L. Madrid, 611 E. Colton Ave., Redlands, Calif. 92373

Filed Sep. 10, 1998, Appl. No. 93,405

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—209



421,787

WATER SWEEPER

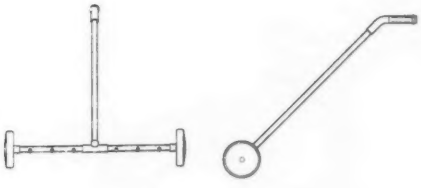
Richard D Neitz, 18151 E. Valley Blvd. #73, La Puente, Calif. 91744

Filed May 6, 1999, Appl. No. 104,608

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—213



421,788

FILL VALVE FLOAT

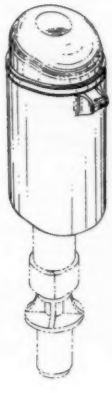
Ross E. Kingman, Elyria; Edward D. Kastelic, Sheffield Village, and Tim A. Frick, Strongsville, all of Ohio, assignors to Moen Incorporated, Olmsted, Ohio

Filed Apr. 29, 1999, Appl. No. 104,171

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—236

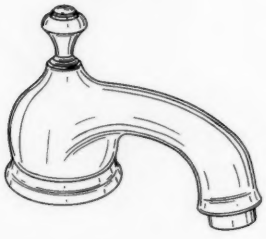


421,789

SPOUT

Wilfried Delker, Bridgewater, N.J., and Walter Schmitz, Bruch, Germany, assignors to American Standard Inc., Piscataway, N.J.

Filed Mar. 5, 1997, Appl. No. 67,163
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—255



421,790

PULL-OUT SPOUT

Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

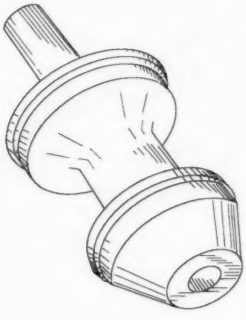
Filed Oct. 5, 1998, Appl. No. 94,546
This patent is subject to a terminal disclaimer.
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—255

421,791

DOUBLE-SEATED CONTROL VALVE PLUG

Hideo Ohtani; Ryoji Okutsu, both of Kanagawa-Pref, and Ryuji Shinozaki, Tokyo, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1997, Appl. No. 73,457
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—260

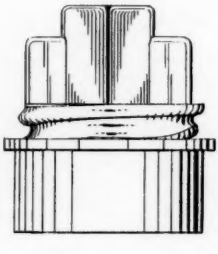


421,792

TWO PIECE MECHANICAL PLUG ASSEMBLY

Marc P. Bevacco, Corcoran, Minn., assignor to Cherne Industries Incorporated, Minneapolis, Minn.

Filed Dec. 16, 1998, Appl. No. 97,864
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—260



421,793

WHIRLPOOL TUB

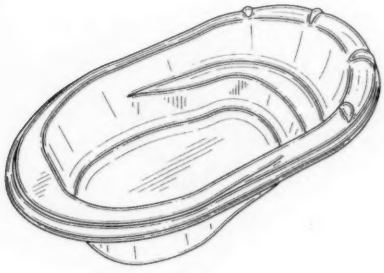
Sean W. Svendsen, Columbus, Ohio, assignor to American Standard Inc., Piscataway, N.J.

Filed Apr. 15, 1999, Appl. No. 103,511

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—277



421,794

TOILET SEAT COVER

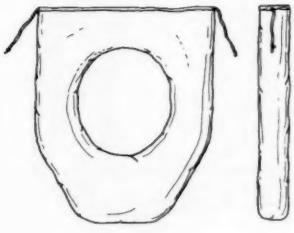
Arnette L Mc Gill, 2767 Augustine Ct., Deltona, Fla. 32738

Filed Oct. 29, 1998, Appl. No. 95,776

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—311



421,795

GAS FIREPLACE FRONT

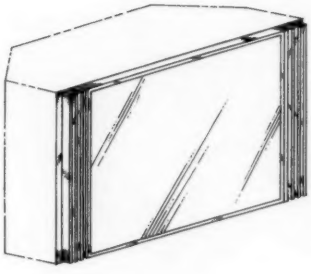
John T. French, Los Angeles; Raymond G. Smith, Pasadena, and Marcel De Jong, Yorba Linda, all of Calif., assignors to Superior Fireplace Company, Fullerton, Calif.

Division of application No. 29/061,216, Oct. 18, 1996, Pat. No. Des. 390,936. This application Jul. 3, 1997, Appl. No. 73,211.

Term of patent 14 years

LOC (6) Cl. 23 - *03*

U.S. Cl. D23—350



421,796

PORTABLE DISINFECTOR

Yoshihiro Sakurai, Tokyo, Japan, assignor to Kabushiki Kaisha Lucent, Tokyo, Japan

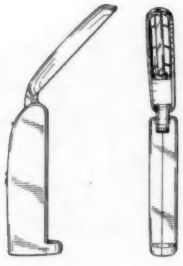
Filed Jun. 18, 1998, Appl. No. 89,558

Claims priority, application Japan, Dec. 19, 1997, 9-78753

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—366



421,797

COMBINED CEILING FAN AND LIGHT FIXTURE

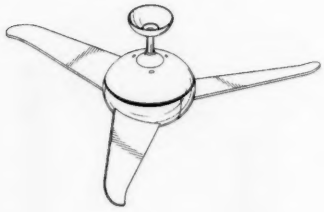
Ted P. Collmar, Corona, Calif., assignor to Great 2000 Enterprises, Inc., Corona, Calif.

Filed Feb. 11, 1999, Appl. No. 100,590

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—377



421,798

RADIATING FAN

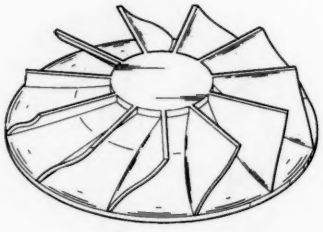
Te Liang, 4F, No.510, Ta Chin Street, Nan District, Tai Chung, Taiwan

Filed Aug. 11, 1999, Appl. No. 109,105

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—379



421,799

COMBINED ADAPTOR COVER, BLADE IRONS, MOTOR HOUSING AND LIGHT FIXTURE UNIT FOR A CEILING FAN

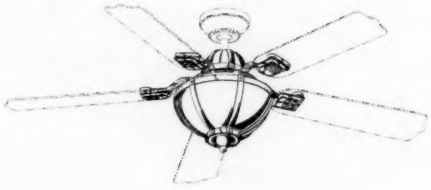
Bradford C. Zuege, Memphis, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Apr. 23, 1999, Appl. No. 103,888

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



421,800

POWDER AND COMPRESSED-AIR INHALER

Arnaud Doat, Castres, France, assignor to Pierre Fabre Medicament, Boulogne, France

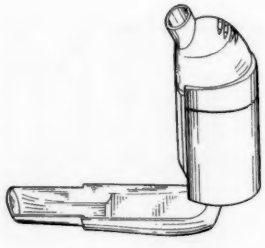
Filed Aug. 19, 1998, Appl. No. 92,536

Claims priority, application France, Feb. 19, 1998, 98 1067

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—110

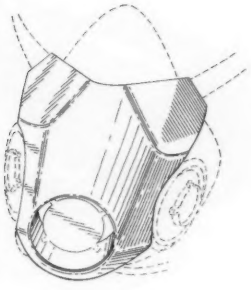


421,801

CARRIAGE FOR DROP-DOWN MASK ASSEMBLY

Gerald M. Brostrom, Burnsville, Minn., and David C. Byram, River Falls, Wis., assignors to 3M Innovative Properties Company, St. Paul, Minn.

Filed Oct. 3, 1997, Appl. No. 77,630
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D24—110.1



421,802

DISPOSABLE ABSORBENT ARTICLE

Paul Theodore Van Gompel, Hortonville; Thomas Harold Roessler, Menasha; Jody Dorothy Suprise, Pine River; Robert Eugene Vogt, and Timothy James Blenke, both of Neenah, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

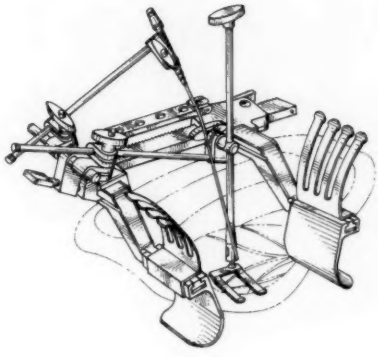
Filed Jun. 4, 1999, Appl. No. 106,013
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—126

421,803

RETRACTOR FOR CORONARY ARTERY BYPASS SURGERY

Tibor B. Koros, and Gabriel J. Koros, both of 610 Flinn Ave., Moorpark, Calif. 93021

Filed Mar. 7, 1998, Appl. No. 84,672
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—135



421,804

BABY PACIFIER

Richard E. Gill, 4575 Lakeside Dr., Reno, Nev. 89509

Filed Apr. 15, 1999, Appl. No. 103,530
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—195

421,805

TRDS- AC STAR BEACH EROSION INHIBITOR

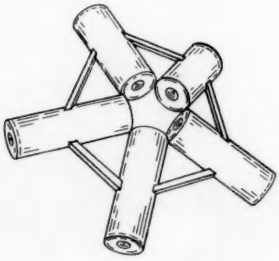
Darwin Aldis Salls, P.O. Box 770126, Ocala, Fla. 34477-0126

Filed Dec. 2, 1997, Appl. No. 80,350

Term of patent 14 years

LOC (6) Cl. 25 - *02*

U.S. Cl. D25—58



421,806

PAVING STONE

Torsten Graf; Andrea Graf, both of Dr.-Hugo-Bischoff-Strasse 10, Bad Dürkheim, Germany, 67098, and Gunter Biermann, Dahlienweg 6, Grünstadt, Germany, 67269

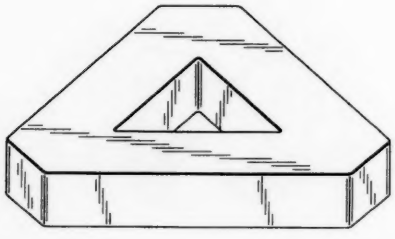
Filed Nov. 5, 1998, Appl. No. 96,123

Claims priority, application Germany, May 5, 1998, 98 04 397

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—113



421,807

METAL PROFILE

Robert Cameron Reid, 41 Edward Bennett Dr., Cherrybrook, New South Wales, 2126, Australia

Filed Dec. 3, 1996, Appl. No. 63,251

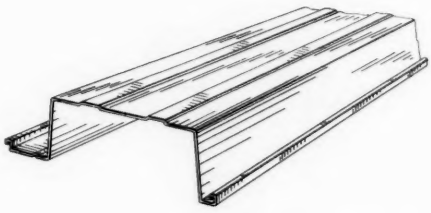
Claims priority, application Australia, Jun. 4, 1996, 1733/96

This patent is subject to a terminal disclaimer.

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—125



421,808

DECK PLANK SUPPORT EXTRUSION

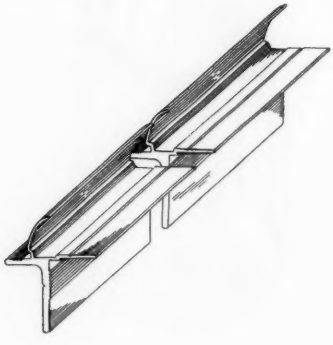
Michael T. Chaney, Middletown; Jonathan C. Hauberg, Beavercreek, and Paul A. Siudzinski, Springboro, all of Ohio, assignors to Dayton Technologies, Inc., Monroe, Ohio

Filed Jun. 10, 1999, Appl. No. 106,089

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—125

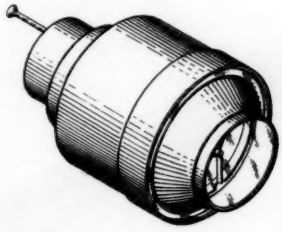


421,809

FOCUSED XENON LAMP

Roy D. Roberts, Hayward, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.

Filed Dec. 22, 1998, Appl. No. 98,246
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—24



421,810

FLAT TO SPIRAL LIGHT SET

Najeh Rahman, Monsey, N.Y., assignor to Minami International Co., Yonkers, N.Y.

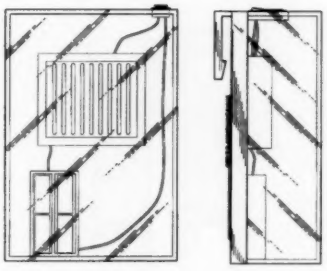
Filed Dec. 10, 1998, Appl. No. 97,719
Term of patent 14 years
LOC (6) Cl. 26 - *04*
U.S. Cl. D26—25

421,811

PURSE LIGHT

Leonidas Prepas, 13 Bridle Path, Nashua, N.H. 03061

Filed Aug. 19, 1999, Appl. No. 109,672
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—37

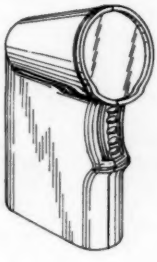


421,812

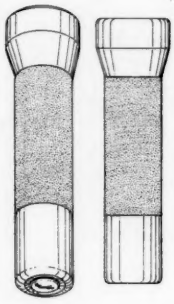
FLASHLIGHT

James U. Neyer, Middleton, Wis.; Tor H. Petterson, Rancho Palos Verdes, Calif.; Zoltan Pavlakovich, Woodland Hills, Calif.; Bret T. Huber, Cerritos, Calif., and Charles P. Davis, Torrance, Calif., assignors to Rayovac Corporation, Madison, Wis.

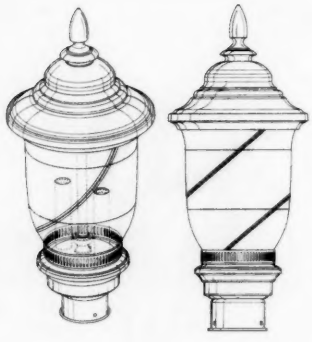
Filed Sep. 10, 1999, Appl. No. 110,712
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—45



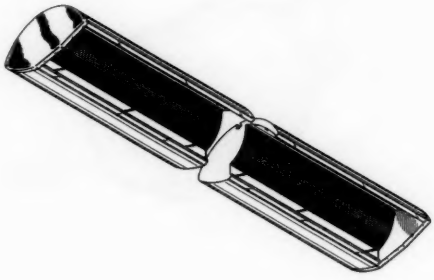
421,813
FLASHLIGHT
Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.
Filed Oct. 24, 1997, Appl. No. 78,939
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—46



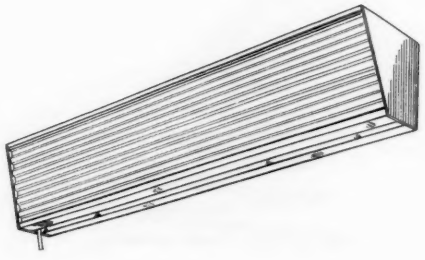
421,814
OUTDOOR LAMP
Leslie A. Meck, Fleetwood, and Rockwood T. Roberts, III, Shillington, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 30, 1998, Appl. No. 95,819
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—67



421,815
WALL WASH LUMINAIRE
Douglas J. Herst, Oakland, and Utkan Salman, Ross, both of Calif., assignors to Peerless Lighting Corporation, Berkeley, Calif.
Filed Jul. 29, 1996, Appl. No. 57,649
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—76



421,816
MODULAR LIGHTING FIXTURE
Antonio Canton Gongora; Carlos Jesús Cruz Fernandez; José María Muñagorri Enriquez, and Juan Carlos Rayo Ortigüela, all of Madrid, Spain, assignors to Telefonica de Espana, S.A., Madrid, Spain
Filed Nov. 21, 1996, Appl. No. 62,704
Claims priority, application Spain, May 21, 1996, 137528
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—76



421,817

HEADLAMP BEZEL FOR A MOTOR VEHICLE

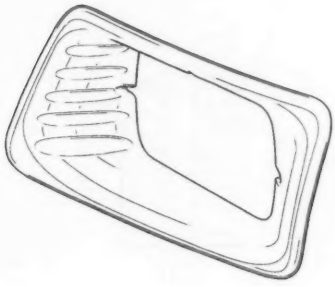
Eric N. Tucker, and John G. Myers, both of Denton, Tex., assignors to Paccar Inc, Bellevue, Wash.

Filed Jun. 3, 1999, Appl. No. 105,926

Term of patent 14 years

LOC (6) Cl. 26 - *99*

U.S. Cl. D26—139



421,818

HAIR TRIMMER

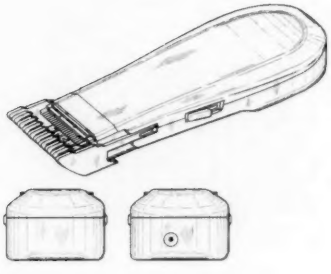
Jonathan N. Mandell, Hattiesburg, Miss., and Albert F. McGovern, Murfreesboro, Tenn., assignors to Sunbeam Products, Inc., Boca Raton, Fla.

Filed Dec. 20, 1996, Appl. No. 64,012

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—53



421,819

LIPSTICK CASE

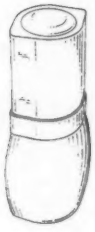
Kristina B. Heeter, Grand Rapids, Mich., and Thierry Francois DeBaschmakoff, Paris, France, assignors to Amway Corporation, Ada, Mich.

Filed Sep. 8, 1999, Appl. No. 110,506

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—85



421,820

PROTECTIVE RESPIRATORY HELMET WITH REAR RECESS DESIGN

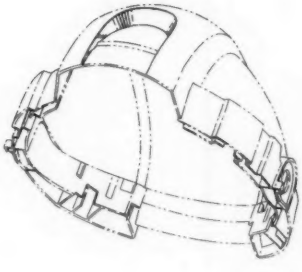
Brett R. Johnson, St. Paul, Minn., assignor to 3M Innovative Properties Company, St. Paul, Minn.

Filed Mar. 10, 1998, Appl. No. 84,759

Term of patent 14 years

LOC (6) Cl. 29 - *02*

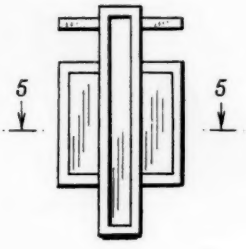
U.S. Cl. D29—122



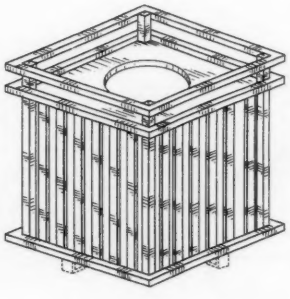
421,821
ANIMAL FEEDING DEVICE
Lee Kinjerski, 1399 Cty O, Forestville, Wis. 54213
Filed Aug. 20, 1998, Appl. No. 92,509
Term of patent 14 years
LOC (6) Cl. 30 - *07*
U.S. Cl. D30—121

421,822
ANIMAL TETHERING DEVICE
Rhonda D. Van Hale, Mora, Minn., assignor to T & L Nifty Products, Inc., Braham, Minn.
Filed May 11, 1999, Appl. No. 104,750
Term of patent 14 years
LOC (6) Cl. 30 - *09*
U.S. Cl. D30—154

421,823
COMBINED LITTER AND RECYCLING BIN
Richard Meier, New York, N.Y., assignor to More Group PLC, London, United Kingdom
Filed Oct. 20, 1998, Appl. No. 95,290
Claims priority, application United Kingdom, Apr. 17, 1997, 2064989
Term of patent 14 years
LOC (6) Cl. 09 - *09*
U.S. Cl. D34—1



421,824
SITE FURNITURE IN THE FORM OF A LITTER RECEPTACLE
Marcella Kaye Hornyak, Cabot, Pa., assignor to Keystone Ridge Designs, Inc., Butler, Pa.
Division of application No. 29/088,305, May 20, 1998, Pat. No. Des. 413,449. This application May 20, 1999, Appl. No. 105,218.
Term of patent 14 years
LOC (6) Cl. 09 - *09*
U.S. Cl. D34—1



421,825

CART

Laura McColskey, West Palm Beach; Ryan Mimick, Coral Springs, and Denise Tedaldi, Jupiter, all of Fla., assignors to Levenger Company, Delray Beach, Fla.

Filed May 25, 1999, Appl. No. 105,427

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—24

421,826

LIGHT FIXTURE FOR AN ATM KIOSK OR SURROUND

Ernest R. Dallman, Zionsville, Ind., assignor to Dallman Industrial Corporation, Indianapolis, Ind.

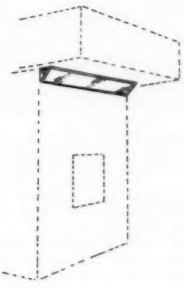
Continuation-in-part of application No. 08/996,421, Dec. 22, 1997, which is a continuation-in-part of application No. 29/047,266, Nov. 30, 1995, Pat. No. Des. 375,091, which is a continuation-in-part of application No. 29/030,929, Nov. 14, 1994, abandoned, which is a continuation-in-part of application No. 29/022,639, May 10, 1994, Pat. No. Des. 361,192.

This application Nov. 25, 1998, Appl. No. 96,983.

Term of patent 14 years

LOC (6) Cl. 99 - *00*

U.S. Cl. D99—43



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Bauman, Thomas C., 6,039,375, Cl. 294-119.100.

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Clark, Christopher Joseph; Moulthrop, Andrew Alfred; Muha, Michael Steven; and Silva, Christopher Patrick, 6,041,077, Cl. 375-224.000.

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Alcon Laboratories, Inc.: *See*—
Conrow, Raymond E., 6,040,468, Cl. 552-543.000.

Aldcroft, Derek; Bates, Sharron; and Earl, Graham James, to Crosfield Limited. Silica products and UV curable systems. 6,039,798, Cl. 106-272.000.

Aldridge, Donald; and Curtis, Nicholas J., to Lion Apparel, Inc. Lightweight firefighter garment with durable collar and wristlet material. 6,038,700, Cl. 2-81.000.

Aldwin, Lois: *See*—
Winkler, James L.; Fodor, Stephen P. A.; Buchko, Christopher J.; Ross, Debra A.; Aldwin, Lois; and Modlin, Douglas N., 6,040,193, Cl. 436-180.000.

Aleksic, Milivoje: *See*—
Wong, Daniel; and Aleksic, Milivoje, 6,040,837, Cl. 345-430.000.

Alexander, Jerry: *See*—
Strickland, Charles, 6,039,544, Cl. 417-53.000.

Alexandrov, Andrej Fedorovich: *See*—
Antonova, Tatijana Borisovna; Bougrov, Gleb Elmirovich; Kondranin, Sergey Gennadievich; Kralkina, Elena Alexandrovna; Pavlov, Vladimir Borisovich; Alexandrov, Andrej Fedorovich; and Rukhadze, Anri Amvrosievich, 6,040,547, Cl. 219-121.430.

Alexion Pharmaceuticals, Inc.: *See*—
Rollins, Scott; Rother, Russell P.; Matis, Louis A.; and Evans, Mark J., 6,040,428, Cl. 530-350.000.

Alfano, Donald E.: *See*—
Huynh, Quoi V.; Ngo, Sang T.; Judkins, Joseph James, III; and Alfano, Donald E., 6,040,668, Cl. 318-471.000.

Alfonso, Jorge; Elbon, Leonard R.; Franzoi, Eric A.; and Finnerty, Donald Wayne, to Formica Corporation. Particle filled resinous product of improved appearance. 6,040,045, Cl. 428-327.000.

Alfred Butler, Inc.: *See*—
Butler, Jerome, 6,038,751, Cl. 29-10.000.

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Poreh, Illan; Algom, Avner; Vaindiner, Alexander; and Shpilberg, Ilya, 6,040,832, Cl. 345-340.000.

Alikhanov, Khallar Abdumuslimovich: *See*—
Golovistikov, Ivan Nikolaevich; Kacharava, Leonid Yazonovich; and Alikhanov, Khallar Abdumuslimovich, 6,040,187, Cl. 436-63.000.

Alimak AB: *See*—
Backman, Bo, 6,038,828, Cl. 52-588.100.

All Best Electronics Co., Ltd.: *See*—
Yang, George, 6,039,611, Cl. 439-701.000.

Allart, Bernard: *See*—
Mangano, Alain; Allart, Bernard; Bigo, Louis; Garczarek, Michel; Ethet, Yannick; Crave, Joël; and Peignon, Philippe, 6,038,859, Cl. 60-436.000.

Allegheny-Singer Research Institute: *See*—
Rabin, Yoed; Julian, Thomas Benjamin; and Wolmark, Norman, 6,039,730, Cl. 606-23.000.

Allelix Biopharmaceuticals, Inc.: *See*—
Kamboj, Rajender; Elliott, Candace E.; and Nutt, Stephen L., 6,040,175, Cl. 435-325.000.

Allen, Jonathon Brandon, to Lucent Technologies Inc. Method and system for ensuring royalty payments for data delivered over a network. 6,041,316, Cl. 705-52.000.

Allen, Loretta E.: *See*—
McIntyre, Dale F.; and Allen, Loretta E., 6,040,849, Cl. 347-214.000.

Allen, Michael P.; Ellsworth, Stoughton L.; Ensler, Lawrence M.; and Subramanian, Kumar, to First Medical, Inc. Blood separator system. 6,039,868, Cl. 210-232.000.

Allgon Ab: *See*—
Larsson, Lennart; and Folkesson, Rolf, 6,041,083, Cl. 375-304.000.

Allied Colloids Limited: *See*—
Symes, Kenneth Charles; and Mistry, Kishor Kumar, 6,039,900, Cl. 264-4.100.

AlliedSignal: *See*—
Olzak, Richard A., 6,040,526, Cl. 174-52.100.

AlliedSignal Inc.: *See*—
Khanna, Yash P.; Puterbuagh, Frank H., Jr.; Kuhn, William P.; and Schena, Martin J., 6,040,392, Cl. 525-432.000.
Liston, Laurence D. N.; Schoepf, Joseph L.; and Royalty, Charles Michael, 6,039,287, Cl. 244-54.000.
Nims, Robert A.; O'Brien, Patrick Lee; and Emerson, Terrence, 6,040,635, Cl. 290-52.000.

Alliger, Howard. Use of xanthan gum for gelling ClO_2 and related species. 6,039,934, Cl. 424-53.000.

Allsoft Distributing Incorporated: *See*—
Colvin, Bryan, Sr., 6,041,123, Cl. 380-49.000.

Allsop, Inc.: *See*—
Clausen, Eivind, 6,039,190, Cl. 211-40.000.

Alps Electric Co., Ltd.: *See*—
Matsuura, Takanobu, 6,039,477, Cl. 400-236.000.
Oguchi, Wataru, 6,039,587, Cl. 439-159.000.
Takeshita, Naoki; Kusano, Manabu; Sagawa, Fumihiko; and Nakagawa, Taizo, 6,040,529, Cl. 174-254.000.
Yeol, Oh Eui; Mitsumori, Kenichi; and Miyazawa, Satoshi, 6,039,815, Cl. 134-2.000.

Alstom: *See*—
Courault, Jacques, 6,040,990, Cl. 363-59.000.

Alt, Helmut G.: *See*—
Peifer, Bernd; Palackal, Syriac J.; Welch, M. Bruce; Alt, Helmut G.; and Schertl, Peter, 6,040,402, Cl. 526-160.000.

Altera Corporation: *See*—
Mejia, Manuel, 6,040,712, Cl. 326-82.000.

Alterman, Steven S.; Sanchez, Mauricio E.; and Longhurst, Audrey, to Motorola, Inc. Method for accessing an information network from a radio communication system. 6,041,045, Cl. 370-313.000.

Alton, Alfred J.; Beese, James P.; Ekmanis, Juris L.; Henne, Bruce J.; and Smith, William F., to Eastman Kodak Company. Photothermographic and thermographic films containing low levels of unsaturated fatty acid to prevent fog. 6,040,130, Cl. 430-617.000.

Alvarez, Jose M.: *See*—
Sanchez, Hector; Alvarez, Jose M.; Siegel, Joshua; and Nicoletta, Carmine, 6,040,729, Cl. 327-309.000.

Alvarez, William. Break-away lug nut positioner. 6,039,408, Cl. 301-111.000.

Alza Corporation: *See*—
Venkatraman, Subramanian S.; Murdock, Thomas O.; and Pudjijanto, Stephanus, 6,039,977, Cl. 424-486.000.

Amada Company, Limited: *See*—
Nagasawa, Tadahiko, 6,038,899, Cl. 72-14.800.

Amana Company, L.P.: *See*—
Pink, John J., 6,039,424, Cl. 312-405.100.

Amano, Akira: *See*—
Sobajima, Yoshihiro; Akashige, Etsushi; Fujii, Hironari; and Amano, Akira, 6,040,374, Cl. 524-451.000.

Amano, Kesayoshi: *See*—
Kakizaki, Yukio; Kiuchi, Toru; Amano, Kesayoshi; and Umatate, Toshikazu, 6,040,096, Cl. 430-5.000.

Amari, Takeyuki: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

Amato, Domenick V.; and Gorton, Earl M., to PPG Industries Ohio, Inc. Stabilization of vinylidene chloride. 6,040,488, Cl. 570-264.000.

Amerasekera, E. Ajith: *See*—
Duvvury, Charvaka; Amerasekera, E. Ajith; and Ramaswamy, Sridhar, 6,040,968, Cl. 361-56.000.

American Home Products Corporation: *See*—
Franco, Rodrigo; Chen, Ai Ru Sun; and Shuey, David Joseph, 6,040,436, Cl. 536-23.100.

American Piledriving Equipment, Inc.: *See*—
White, John L., 6,039,508, Cl. 405-232.000.

American University of Baku, The: *See*—
Agalarov, Jafar; Nasibova, Ayten; and Nuriyev, Barat, 6,039,011, Cl. 123-51.0AA.

Ameritech Corporation: *See*—
Lipton, Marc Ira; and Dunny, Gregory John, 6,041,104, Cl. 379-67.100.

Amero, Willard F., Jr.; and Herrmann, John E., to Motorola, Inc. Adapter system. 6,039,608, Cl. 439-651.000.

Amersham Pharmacia Biotech AB: *See*—
Horn, Marcus J., 6,039,924, Cl. 422-67.000.

Amin-Salehi, Bahman: *See*—
Bigham, John A.; Little, Dave; Mihm, Edward C.; Sistanizadeh, Kamran; Amin-Salehi, Bahman; Jain, Alpna; Lightfoot, Regina; and Arthur, Ulric E., 6,041,056, Cl. 370-395.000.

Ammann, Klaus; and Bäther, Wolfgang, to Drager Sicherheitstechnik GmbH. Device and process for indicating the exhaustion of a filter. 6,040,777, Cl. 340-632.000.

Amos, David J.; and Stokes, Mitchell O., to Siemens Westinghouse Power Corporation. Main stage fuel mixer with premixing transition for dry low No_x (DLN) combustors. 6,038,861, Cl. 60-737.000.

Amos, Jay: *See*—
Raulerson, David A.; Amos, Jay; and Smith, Kevin D., 6,040,695, Cl. 324-240.000.

Amphenol Corporation: *See*—
Clark, Timothy Edward, 6,041,152, Cl. 385-24.000.

Amro, Hatim Yousef; and Dodson, John Paul, to International Business Machines Corporation. Method and system in a computer network for an intelligent search engine. 6,041,326, Cl. 707-10.000.

An, Suk Ku: *See*—
Cornell, Robert W.; and An, Suk Ku, 6,038,772, Cl. 30-233.000.

Analog Devices, Inc.: *See*—
Brokaw, A. Paul, 6,040,732, Cl. 327-408.000.
Ferguson, Paul F., Jr.; and Wilson, James, 6,040,793, Cl. 341-143.000.

Analytica of Branford, Inc.: *See*—
Whitehouse, Craig M.; and Andrien, Bruce A., Jr., 6,040,575, Cl. 250-288.000.

Anczykowski, Boris: *See*—
Cleveland, Jason P.; and Anczykowski, Boris, 6,038,916, Cl. 73-105.000.

Anderbouhr, Stéphanie; Schuster, Frédéric; Blanquet, Elisabeth; and Theret, Gérald, to Commissariat a L'Energie Atomique. Process for the preparation by chemical vapor deposition (CVD) of a Ti-A1-N based multilayer coating. 6,040,012, Cl. 427-255.391.

Andersen, Finn Thrige: *See*—
Martin, Wallace Anthony; Adams, Jonathan Patrick; Andersen, Finn Thrige; Beaton, Stephen Robert; Christensen, Svend; Jensen, Allan G.; Kindt-Larsen, Ture; Lust, Victor; Walker, Craig William; and Wang, Daniel Tsu-Fang, 6,039,899, Cl. 264-1.360.

Andersen, Knud Erik; Jørgensen, Tine Krogh; Hohlweg, Rolf; Fischer, Erik; Olsen, Uffe Bang; Polivka, Zdenek; Sindelar, Karel; and Valenta, Vladimir, to Novo Nordisk A/S. Tricycle substituted with azaheterocyclic carboxylic acids. 6,040,318, Cl. 514-329.000.

Andersen, Knud Erik: *See*—
Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.

Anderson, Charles C.: *See*—
Chen, Jiann H.; Lancaster, Robert A.; Tsou, Andy H.; and Anderson, Charles C., 6,041,210, Cl. 399-333.000.

Anderson, David C.; and Stephenson, Daniel Lee, to Lucent Technologies Inc. Universal dust cover. 6,041,155, Cl. 385-139.000.

Anderson, David K.; Chiu, John H.; McNary, Steven F.; Phyfe, Nicole M.; Turek, David G.; and Mylchreest, Donald G., to Combustion Engineering, Inc. Steam generator having an improved structural support system. 6,039,008, Cl. 122-510.000.

Anderson, David M.: *See*—
Rice, Douglas; Carozzi, Nadine; Anderson, David M.; Rajasekaran, Kanniah; Rangan, Thirumale S.; Yenofsky, Richard; and Lotstein, Richard, 6,040,504, Cl. 800-314.000.

Anderson, Michael E.: *See*—
Monroe, John W.; Smith, John J.; Kenyon, Stephen C.; and Anderson, Michael E., 6,040,843, Cl. 345-507.000.

Andersson, Russell L., to Lucent Technologies Inc. Method and apparatus for synchronizing video signals. 6,040,871, Cl. 348-510.000.

Ando, Shuichi: *See*—
Yamazaki, Motohiro; Ando, Shuichi; and Toyama, Akira, 6,041,291, Cl. 702-191.000.

Andoh, Tomio; Shibata, Shiro; and Marugame, Tomoyuki, to Toppan Printing Co., Ltd. Method and apparatus for forming transfer images and transfer drum used in the same. 6,039,480, Cl. 400-662.000.

Andresen, Bernhard H.: *See*—
Blake, Terence G. W.; Andresen, Bernhard H.; and Wall, Frederick G., 6,040,708, Cl. 326-33.000.

Andrews, John R.; Torpey, Peter A.; Burke, Cathie J.; and Freire, Eduardo M., to Xerox Corporation. Thermal ink-jet printhead with lateral thermal insulation for the heating elements. 6,039,436, Cl. 347-62.000.

Andrews, Malcolm John: *See*—
Mabry, Melinda Ann; Rumpf, Frederick Harry; Podobnik, Ivan Zlatko; Westveer, Scott Adrian; Morgan, Allan Clark; Chung, Bin; and Andrews, Malcolm John, 6,040,364, Cl. 523-318.000.

Andrien, Bruce A., Jr.: *See*—
Whitehouse, Craig M.; and Andrien, Bruce A., Jr., 6,040,575, Cl. 250-288.000.

Androski, Frank J.; Binowski, Nancy; Ehlinger, James; Robinson, Jerry Allen; and Sheinbein, Daniel, to AT&T Corp. Distributed network control and fabric application interface. 6,041,117, Cl. 379-268.000.

Angstwurm, Klemens: *See*—
Scholz, Peter; Weber, Jörg; and Angstwurm, Klemens, 6,040,336, Cl. 514-468.000.

Anscher, Joseph; and Capiello, Raymond, to National Molding Corporation. Pre-loadable cord lock. 6,038,746, Cl. 24-115.00G.

Antaya, Stephen: *See*—
Pereira, John; Machado, Manuel; and Antaya, Stephen, 6,039,616, Cl. 439-874.000.

Antaya Technologies Corporation: *See*—
Pereira, John; Machado, Manuel; and Antaya, Stephen, 6,039,616, Cl. 439-874.000.

Antcom Corp.: *See*—
Huynh, Son Huy; and Cheng, George, 6,040,805, Cl. 343-785.000.

Antel, Jochen: *See*—
David, Samuel; Antel, Jochen; Brueckner, Reinhard; Ziegler, Dieter; Eeckhout, Christian; Bielenberg, Gerhard-Wilhelm; and Peck, Michael, 6,040,303, Cl. 514-218.000.

Anthony, John Mark; Wallace, Robert M.; Wei, Yi; and Wilk, Glen, to Texas Instruments Incorporated. Method of forming a nano-rugged silicon-containing layer. 6,040,230, Cl. 438-398.000.

Antoine, Dominique; and Hantz, Dominique, to Seb S.A. Method for making an inductor. 6,038,760, Cl. 29-605.000.

Anton, Waifong Liew: *See*—
Page, Loretta Ann Grezzo; Spinelli, Harry Joseph; and Anton, Waifong Liew, 6,040,358, Cl. 523-161.000.

Antoni, Daniele: *See*—
Perrier, Eric; Antoni, Daniele; and Huc, Alain, 6,039,961, Cl. 424-401.000.

Antonova, Tatijana Borisovna; Bougrov, Gleb Elmirovich; Kondranin, Sergey Gennadievich; Kralkina, Elena Alexandrovna; Pavlov, Vladimir Borisovich; Alexandrov, Andrej Fedorovich; and Rukhadze, Anri Amvrosievich, to Plasma Tech Co., Ltd. Gas discharge device. 6,040,547, Cl. 219-121.430.

Anumula, Sudhaker Reddy; and Wu, Ping, to Cypress Semiconductor Corporation. Circuit and method for controlling memory depth. 6,041,388, Cl. 711-100.000.

AnySoft Ltd.: *See*—
Poreh, Illan; Algom, Avner; Vaindiner, Alexander; and Shpilberg, Ilya, 6,040,832, Cl. 345-340.000.

Anzai, Makoto, to NEC Corporation. Carrier regenerating circuit, multi-level quadrature amplitude demodulator, and method of detecting frequency deviation. 6,041,085, Cl. 375-326.000.

Anzaki, Toshiaki; and Ogino, Etsuo, to Nippon Sheet Glass Co., Ltd. Transparent electrically conductive film-attached substrate and display element using it. 6,040,056, Cl. 428-432.000.

Aoki, Kazuomi: *See*—
Fujii, Nobuhiko; Nakada, Mitsuyuki; and Aoki, Kazuomi, 6,040,377, Cl. 524-571.000.

Aoki, Kunimitsu: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

Aoki, Nobuyuki: *See*—
Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.

Aoki, Norihiko, to Olympus Optical Co., Ltd. Real-image zoom finder with rotationally asymmetric surface. 6,041,193, Cl. 396-379.000.

Aoki, Noriyuki: *See*—
Iwata, Naohiro; Obana, Katsumi; Terashima, Hideyuki; and Aoki, Noriyuki, 6,040,919, Cl. 358-400.000.

Aono, Kiyomi: *See*—
Noguchi, Hiromichi; Sugitani, Hiroshi; Koizumi, Yutaka; Inamoto, Tadayoshi; Aono, Kiyomi; and Nakata, Yoshie, 6,040,002, Cl. 427-96.000.

Aoshika, Shoji: *See*—
Takeuchi, Yoshiharu; Aburaya, Kiyoji; Yasu, Toshiharu; Tsubokawa, Masahiro; Sakai, Manabu; Aoshika, Shoji; and Narita, Tsutayoshi, 6,039,551, Cl. 418-88.000.

Apollo Fire Detectors Limited: *See*—
Payne, Roger Dennis, 6,040,769, Cl. 340-506.000.

Appleton Papers, Inc.: *See*—
Haley, Tedford E., 6,038,834, Cl. 53-399.000.

Applied Materials, Inc.: *See*—
Chang, Mei; Wang, David N. K.; White, John M.; and Maydan, Dan, 6,040,022, Cl. 427-579.000.
Schmitt, John V.; and Marsh, Richard A., 6,038,919, Cl. 73-149.000.
Tanaka, Tsutomu; Kelkar, Mukul; Fairbairn, Kevin; Ponnekanti, Hari; and Cheung, David, 6,039,834, Cl. 156-345.000.
Yudovsky, Joseph; and Kori, Moris, 6,040,011, Cl. 427-255.280.

Appropriate Engineering and Manufacturing: *See*—
Ehlers, Jeffrey D.; and Sterner, Mark H., 6,040,503, Cl. 800-313.000.

Aptar Group, Inc.: *See*—
Dallas, Milton R., Jr.; and Randall, Jeffrey T., 6,039,224, Cl. 222-565.000.

Aquafine Corporation: *See*—
Ng, Tony; and Murphy, Mike, 6,039,460, Cl. 362-267.000.

Aquatrols Corporation of America, Inc.: *See*—
Kostka, Stanley J.; and Pan, Rennan, 6,039,966, Cl. 424-405.000.

Arai, Hatsuyuki; and Ikeyama, Yasushi, to Speedfam Co., Ltd. Polishing pad control method and apparatus. 6,040,244, Cl. 438-691.000.

Arai, Masayuki; and Kobayashi, Seiji, to Sony Corporation. Circuit board having general purpose region and programmable region. 6,040,985, Cl. 361-780.000.

Arai, Yasuyuki: *See*—
Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, 6,040,520, Cl. 136-245.000.

Arakawa, Seiichi; Matsute, Masataka; and Kawate, Yasutoshi, to Sony Corporation. Guest-host liquid crystal display device and guest-host liquid crystal composition. 6,039,893, Cl. 252-299.010.

Araki, Mitsutoshi: *See*—
Tomita, Taku; Araki, Mitsutoshi; and Yasuda, Naoyuki, 6,039,071, Cl. 137-505.370.

Araki, Tomoaki: *See*—
Sato, Hisaaki; Kumagai, Masato; and Araki, Tomoaki, 6,039,027, Cl. 123-399.000.

Araki, Toshiyuki: *See*—
Narisawa, Yoshiyuki; and Araki, Toshiyuki, 6,041,128, Cl. 381-322.000.

Arangio, James D.: *See*—
Sciarretta, William A.; Setzco, Paul; and Arangio, James D., 6,039,580, Cl. 439-63.000.

Aratani, Sukekazu: *See*—
Matsuyama, Shigeru; Asuma, Hiroaki; Shimura, Masato; Tomita, Yoshifumi; and Aratani, Sukekazu, 6,040,887, Cl. 349-141.000.

Arch Development Corporation: *See*—
Brasitus, Thomas A.; Bissonnette, Bruce Marc; and Sitrin, Michael D., 6,040,300, Cl. 514-167.000.
Pottenger, Lawrence A.; and Draganich, Louis F., 6,039,764, Cl. 623-20.000.

Archambaud, Denis: *See*—
Martin, Varenka; Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Yoshida, Satoshi; Winckel, Laurent; and Weigelt, Oliver, 6,041,217, Cl. 455-38.300.

Archibald, Charles Andrew: *See*—
Gutierrez, Ernesto Jose; Archibald, Charles Andrew; Kachur, Christopher M.; and Brandon, Giles M., 6,038,871, Cl. 62-133.000.

Archuleta, Tom: *See*—
Calamur, Narasimhan; Carrera, Martin E.; Devlin, David J.; and Archuleta, Tom, 6,039,792, Cl. 95-45.000.

Argillier, Jean-Francois: *See*—
Audibert, Annie; Argillier, Jean-Francois; Bailey, Louise; and Reid, Paul I., 6,040,276, Cl. 507-214.000.

Ariga, Masato: *See*—
Kimura, Nobutake; Ariga, Masato; Yamakawa, Hirohito; Nakagawa, Yoshio; and Shimizu, Akio, 6,040,495, Cl. 800-8.000.

Arimori, Susumu; Seko, Masahiro; Tanaka, Masakazu; Monden, Noriko; and Yokota, Hideyuki, to Toyobo Co., Ltd. Biocompatible polymers. 6,040,415, Cl. 528-71.000.

Aritake, Hirokazu: *See*—

Hasegawa, Shinya; Kayashima, Shigeo; Maeda, Satoshi; and Aritake, Hirokazu, 6,040,929, Cl. 359-17.000.

Arjobex Limited: *See*—
Dalgleish, David Thomson; and Sands, Matthew Richard, 6,040,042, Cl. 428-308.400.

Armatron International, Inc.: *See*—
Cherry, James R.; and Raynus, Abel, 6,040,765, Cl. 340-436.000.

Armitage, Jonathan Richard: *See*—
Kashyap, Raman; and Armitage, Jonathan Richard, 6,041,069, Cl. 372-6.000.

Armor, Francis L. Leg operated trash barrel lid controller. 6,039,200, Cl. 220-263.000.

Arnold, Roger D.: *See*—
Fleck, Rod G.; and Arnold, Roger D., 6,041,387, Cl. 711-5.000.

Arp, Robert A.: *See*—
Fogarty, Terence M.; and Arp, Robert A., 6,039,712, Cl. 604-93.000.

Arrow Art Finishers, L.L.C.: *See*—
Smith, Michael J., 6,038,797, Cl. 40-312.000.

Arthur, Ulric E.: *See*—
Bigham, John A.; Little, Dave; Mihm, Edward C.; Sistanizadeh, Kamran; Amin-Salehi, Bahman; Jain, Alpna; Lightfoot, Regina; and Arthur, Ulric E., 6,041,056, Cl. 370-395.000.

Arzeno, Humberto B.: *See*—
Dvorak, Charles A.; Wren, Douglas L.; Fisher, Lawrence E.; Axt, Steven D.; Humphreys, Eric R.; Arzeno, Humberto B.; Beard, Colin C.; Nguyen, Sam Linh; Han, Yeun-Kwei; Roberts, Christopher R.; Lund, Jan P.; and Fatheree, Paul R., 6,040,446, Cl. 544-276.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Doi, Ichiro; and Tonomura, Shoichiro, 6,041,096, Cl. 378-48.000.
Yamamatsu, Setsuo; Yamaguchi, Tatsuo; and Yokota, Koshiro, 6,040,472, Cl. 560-210.000.

Asahi Kogaku Kogyo Kabushiki Kaish: *See*—
Sensui, Takayuki, 6,041,186, Cl. 396-80.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Mitoh, Ayumi; and Hiraide, Tsuneo, 6,040,196, Cl. 436-518.000.
Oono, Masahiro; Iwanade, Hisao; Saitoh, Noboru; Sato, Koji; Shiba, Sukenori; Yoshida, Tatsuya; and Nagai, Nobuyuki, 6,040,677, Cl. 318-696.000.
Seo, Shuzo, 6,039,255, Cl. 235-462.350.
Yamamoto, Yasuhiro, 6,041,192, Cl. 396-315.000.
Yamamoto, Yasuhiro, 6,041,194, Cl. 396-429.000.

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Kurosawa, Motoharu; and Abe, Hiroshi, 6,039,643, Cl. 453-3.000.

Asahi Seiko Kebushiki Kaisha: *See*—
Abe, Hiroshi; and Kurosawa, Motoharu, 6,039,166, Cl. 194-317.000.

Asai, Toshiya; and Narita, Takato, to Sony Corporation. Coding method and recording and reproducing apparatus. 6,040,862, Cl. 348-409.000.

Asami, Shinya: *See*—
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Asano, David K.: *See*—
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Klein, George W., 6,038,819, Cl. 49-362.000.

Aschenbrenner, Kal: *See*—
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Ascom Hasler Mailing Systems, Inc.: *See*—
Brookner, George, 6,041,317, Cl. 705-61.000.

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Frutschi, Hansulrich, 6,038,848, Cl. 60-39.050.
Keller, Jakob; Marlow, Paul; McMillan, Robin; and Valk, Martin, 6,038,863, Cl. 60-742.000.
Rees, Jochen; and Steinke, Jürgen, 6,040,988, Cl. 363-37.000.

Asec Manufacturing General Partnership: *See*—
Nunan, John G., 6,040,265, Cl. 502-242.000.

Asmo, Co., Ltd.: *See*—
Terai, Tadayoshi; Hitomi, Yoshinori; Okano, Masayuki; and Kinoshita, Kazutoshi, 6,038,728, Cl. 15-250.201.

Aspect Telecommunications Corporation: *See*—
Meyers, John D., 6,041,116, Cl. 379-244.000.

Aspen Technology, Inc.: *See*—
Boston, Joseph F.; and Boys, Ian, 6,041,263, Cl. 700-32.000.

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Howard, Richard T., 6,041,173, Cl. 395-500.270.

Astra AB: *See*—
MacDonald, James, 6,040,314, Cl. 514-307.000.

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Gueissaz, François, 6,040,748, Cl. 335-78.000.

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Androski, Frank J.; Binowski, Nancy; Ehlinger, James; Robinson, Jerry Allen; and Sheinbein, Daniel, 6,041,117, Cl. 379-268.000.
Goldberg, Randy G., 6,041,297, Cl. 704-219.000.

AT&T Corp.: *See*—
Ruffolo, Ralph A.; and Sinerchio, John A., 6,041,288, Cl. 702-184.000.

AT&T Wireless Services Inc.: *See*—
Holmes, David William James, 6,039,624, Cl. 445-403.000.

Ateon Networks, Inc.: *See*—
Chen, Ben W.; and Xiong, Bo, 6,041,346, Cl. 709-218.000.

ATI Technologies, Inc.: *See*—
Wong, Daniel; and Aleksic, Milivoje, 6,040,837, Cl. 345-430.000.

Atkinson, Michael R.: *See*—
Havens, Dale I.; and Atkinson, Michael R., 6,038,799, Cl. 40-505.000.

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Harrod, Charles E.; and Stephens, William D., 6,039,819, Cl. 149-19.200.

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Kennelly, Kevin; Gardiner, Ian; Noble, David; and Muliadiredja, Achmad R., 6,039,507, Cl. 405-227.000.
Stevenson, Mark D.; and Brady, Jerry L., 6,039,116, Cl. 166-263.000.

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Schuster, Mike; and Fukada, Toshiaki, 6,041,299, Cl. 704-232.000.

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Woerner, Klaus D.; and Sommers, Allen, 6,039,640, Cl. 451-460.000.

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Aubay, Eric: *See*—
Popoff, Christine; Nartey, Alwyn; Gabriel, Robert; and Aubay, Eric, 6,040,288, Cl. 510-466.000.

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Lallier, Jean-Pierre; Marie, Patrick; Aubry, Jean-Marie; Marti, Marie-José; and Del Nero, Valérie, 6,040,285, Cl. 510-206.000.

Aucsmith, David W.: *See*—
Graunke, Gary L.; and Aucsmith, David W., 6,041,122, Cl. 380-21.000.

Auden Technology Mfg. Co., Ltd.: *See*—
Chang, Daniel, 6,039,459, Cl. 362-253.000.

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DiCroce, John R., 6,040,636, Cl. 307-10.100.

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Berson, William; and Auslander, Judith D., 6,039,257, Cl. 235-468.000.

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Hentschel, Wolfgang, 6,038,765, Cl. 29-857.000.

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Sahoo, Keshaba Chandra, 6,040,830, Cl. 345-335.000.

Autoimmune, Inc.: *See*—
Weiner, Howard L.; and Hafler, David A., 6,039,947, Cl. 424-184.100.

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Cech, Leonard S.; Sewell, Michael R.; Gillis, Edward J.; and Talley, David B., 6,039,345, Cl. 280-735.000.

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Breed, David S.; Duvall, Wilbur E.; and Johnson, Wendell C., 6,039,139, Cl. 180-271.000.

Autoscribe Corporation: *See*—
Pollin, Robert E., 6,041,315, Cl. 705-45.000.

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Ishimori, Shozo; Yamaguchi, Masatoshi; Auvergne, Cristophe; and Leguillette, Bertrand, 6,038,840, Cl. 56-13.300.

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Freedman, Melvin S., 6,040,027, Cl. 428-40.100.

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Spaete, Richard; and Cha, Tai-An, 6,040,170, Cl. 435-252.300.

Avision Inc.: *See*—
Chen, Philip L., 6,041,198, Cl. 399-51.000.

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Schweiger, Gerd, 6,040,190, Cl. 436-164.000.

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Komiya, Satoshi; Awaji, Naoki; and Kashiwagi, Shunji, 6,040,198, Cl. 438-16.000.

Axt, Steven D.: *See*—
Dvorak, Charles A.; Wren, Douglas L.; Fisher, Lawrence E.; Axt, Steven D.; Humphreys, Eric R.; Arzeno, Humberto B.; Beard, Colin C.; Nguyen, Sam Linh; Han, Yeun-Kwei; Roberts, Christopher R.; Lund, Jan P.; and Fatheree, Paul R., 6,040,446, Cl. 544-276.000.

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Sota, Akio; Okiura, Tomoo; and Azuma, Masaki, 6,039,782, Cl. 71-10.000.

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Forber, Simon John, 6,039,744, Cl. 606-108.000.

Baba, Seiji; and Endo, Takashi, to Densoken Co., Ltd. & Shoei Chemical Inc. Surface discharge element and a method of making the same. 6,040,055, Cl. 428-428.000.

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Talley, Laroul J.; Yurek, Theodore F.; Ziegler, Douglas D.; and Robinson, Ross G., 6,038,902, Cl. 72-128.000.

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Bach, Joseph: *See*—
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Chbat, Nicolas Wadih; and Badami, Vivek Venugopal, 6,038,724, Cl. 8-159.000.

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Badillo, Connie M. Liquid soap applicator, and method. 6,039,491, Cl. 401-186.000.

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Baertelin, Carl: *See*—
Agrawal, Anoop; Tonazzi, Juan Carlos Lopez; LeCompte, Robert Steven; Baertelin, Carl; and Fischer, Douglas Alan, 6,039,390, Cl. 296-211.000.

Baichwal, Anand R., to Edward Mendell Co., Inc. Sustained release excipient. 6,039,980, Cl. 424-500.000.

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Wie, Bong; Bailey, David A.; and Heiberg, Christopher J., 6,039,290, Cl. 244-165.000.

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Audibert, Annie; Argillier, Jean-Francois; Bailey, Louise; and Reid, Paul I., 6,040,276, Cl. 507-214.000.

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Baker, Steve G.: *See*—
Quiachon, Dinah B.; Piplani, Alec A.; Baker, Steve G.; Williams, Ronald G.; Williams, Richard S.; Osborn, Kenneth L.; Layman, Ted W.; and Johansson, Peter K., 6,039,758, Cl. 623-1.000.

Baker, Thomas W.; and Mobin, Mohammed S., to Lucent Technologies Inc. Signal decoding for either Manhattan or Hamming metric based Viterbi decoders. 6,041,086, Cl. 375-341.000.

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Balch, Ernest Wayne: *See*—
Wojnarowski, Robert John; Rose, James Wilson; Balch, Ernest Wayne; Douglas, Leonard Richard; Downey, Evan Taylor; and Gdula, Michael, 6,040,226, Cl. 438-381.000.

Balch, Thomas C.: *See*—
Menovcik, Gregory G.; Balch, Thomas C.; Davis, Hilary P.; and Dudek, Paul, 6,040,360, Cl. 523-206.000.

Bald, Erhard: *See*—
Munoz-Baca, Julio Manuel; Bäumer, Klaus; and Bald, Erhard, 6,039,283, Cl. 242-534.000.

Baldwin-Japan Ltd.: *See*—
Hara, Akira; Onuma, Hiraku; Oyaizu, Hideo; Suzuki, Yuuichi; and Gasparrini, C. Robert, 6,038,731, Cl. 15-256.510.

Baldwin, Robert E.: *See*—
Marquis, Edward T.; and Baldwin, Robert E., 6,040,284, Cl. 510-201.000.

Balko, Jack E.: *See*—
Greene, Harold R.; Carder, David W.; and Balko, Jack E., 6,039,510, Cl. 406-21.000.

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Perrault, James J.; and Rouns, Cameron G., 6,039,940, Cl. 424-78.060.

Ballmert, Bernd Jakob: *See*—
Field, Martin John; Ballmert, Bernd Jakob; Collins, Laurence Alexander; and Moran, Robert James, 6,039,034, Cl. 123-568.230.

Balousek, Andrew J., to Unisys Corporation. Misprint detection techniques. 6,039,429, Cl. 347-19.000.

Balzar, Tammy Jo: *See*—
Achter, Amy Michele; Balzar, Tammy Jo; and Fox, Donald George, 6,039,828, Cl. 156-217.000.

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Ban, Takashi; Hoshino, Tatsuyuki; Okabe, Takanori; and Ban, Takahisa, 6,039,007, Cl. 122-26.000.

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Ban, Takashi: *See*—
Okabe, Takanori; Ban, Takashi; Suzuki, Shigeru; and Hirose, Tatsuya, 6,039,264, Cl. 237-12.30R.

Banas, Christopher E.: *See*—
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Bando Chemical Industries, Ltd.: *See*—
Satoh, Hiroki; Taguchi, Yoshio; and Shoyama, Noriko, 6,040,035, Cl. 428-195.000.

Bando, Yumi; Okamura, Takumi; and Murata, Toshinori, to Hitachi, Ltd. Television signal receiving apparatus and method specification. 6,040,867, Cl. 348-423.000.

Bangs, William E.; Khoo, Chor San Heng; and Ko, Sandy, to Campbell Soup Company. Dietary food enhancement agent. 6,039,978, Cl. 424-489.000.

Bangs, William E.; Dibenedetto, Joseph D.; Friedberg, Joyce L.; Giordano, Denise A.; Glover, Judy M.; Khoo, Chor San Heng; Ko, Sandy; MacNair, R. David C.; Noar, Scott R.; Randazzi, John J., Jr.; Stoever, Harro; and Ziegler, Paula J., to Campbell Soup Company. Prepackaged therapeutic meal for treatment of diet-responsive conditions. 6,039,989, Cl. 426-106.000.

Banks, Alan James, to Ford Global Technologies, Inc. Method of mounting a suspension bumper. 6,038,756, Cl. 29-453.000.

Banks, Anthony William: *See*—
Hopkins, William Thomas; Riesland, David Henrik; and Banks, Anthony William, 6,040,778, Cl. 340-650.000.

Banks, Beverly L.; and Banks, Tony C. Drinking straw cleaning system. 6,039,490, Cl. 401-185.000.

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Titterington, Donald R.; and Banning, Jeffery H., 6,039,794, Cl. 106-31.290.

Banno, Satoshi, to NEC Corporation. Radio signal receiving apparatus with audio signal receiving and reproducing function. 6,040,782, Cl. 340-825.250.

Bansemir, Horst, to Eurocopter Deutschland GmbH. Multi-blade rotor for a helicopter. 6,039,538, Cl. 416-134.00A.

Banville, Mario: *See*—
Glitho, Roch; and Banville, Mario, 6,041,327, Cl. 707-10.000.

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Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 6,040,449, Cl. 546-193.000.

Bao, Yang Ying: *See*—
Yasuda, Akio; Nito, Keiichi; Matsui, Eriko; Takanashi, Hidehiko; and Bao, Yang Ying, 6,040,884, Cl. 349-129.000.

Bar-Ilan University: *See*—
Rephaeli, Ada; and Nudelman, Abraham, 6,040,342, Cl. 514-548.000.
Bar, Ofer: *See*—
Douceur, John R.; Bar, Ofer; and Bernet, Yoram, 6,041,053, Cl. 370-389.000.
Barba, Dominique: *See*—
Delagnes, Philippe; and Barba, Dominique, 6,040,853, Cl. 348-128.000.
Barefoot, Byron G. Welding backpressure control apparatus. 6,039,240, Cl. 228-219.000.
Barito, Thomas R.: *See*—
Friedley, Vernon E.; and Barito, Thomas R., 6,039,550, Cl. 418-55.600.
Barker, Frederick H.: *See*—
Bittar, Joseph; Barker, Frederick H.; Cooney, Anthony; Perl, David I.; Peruggi, Richard E.; and Silverberg, Michael D., 6,038,980, Cl. 104-20.000.
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Botich, Michael J.; Halseth, Thor R.; and Barker, John, 6,039,713, Cl. 604-110.000.
Barlow, Yvonne Margaret; and Lang, Stephen Michael, to Smith & Nephew PLC. Wound dressing containing mammalian cells anchored on hydrophobic synthetic polymer film. 6,039,972, Cl. 424-445.000.
Barnard, Chris Wilhelm: *See*—
Khaleghi, Farideh; Solheim, Alan Glen; and Barnard, Chris Wilhelm, 6,040,933, Cl. 359-124.000.
Barnes, Austen. Decamberer. 6,038,904, Cl. 72-234.000.
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Seddon, Mark Arthur; and Barnes, Clive, 6,039,493, Cl. 401-209.000.
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Manev, Vesselin; Faulkner, Titus; Barnette, Wayne; and Gao, Yuan, 6,040,089, Cl. 429-231.100.
Baron, Mark J., to Cowater International Inc. Sewage removal system. 6,038,710, Cl. 4-321.000.
Baron, Richard Carlton: *See*—
Hirt, Thomas; Baron, Richard Carlton; Lohmann, Dieter; and Meier, Wolfgang Peter, 6,039,913, Cl. 264-331.110.
Barr & Stroud Limited: *See*—
Robertson, John, 6,039,632, Cl. 451-41.000.
Barrette, Terrence R.: *See*—
Unger, Evan; McCreery, Thomas; Yellowhair, David; and Barrette, Terrence R., 6,039,557, Cl. 425-429.000.
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McMullen, Jacques; Tsu, Wilson; and Kargel, Reinhard, 6,039,789, Cl. 75-711.000.
Barth, James T., to Selkirk, Inc. Methods of fabricating a vent/intake system for a fuel-fired, direct vent heating appliance. 6,039,041, Cl. 126-85.00B.
Bartoli, Simone: *See*—
Villa, Corrado; Bettini, Luigi; and Bartoli, Simone, 6,040,734, Cl. 327-530.000.
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Knorr, Gottfried; Rotermund, Udo; Baum, Eva; Seifert, Holger; and Wiegmann, Werner, 6,040,349, Cl. 521-131.000.
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Ebel, Klaus; and Hähnle, Hans-Joachim, 6,040,420, Cl. 528-480.000.
Kast, Jürgen; Vossen, Marcus; von Deyn, Wolfgang; Engel, Stefan; Hill, Regina Luise; Kardorff, Uwe; Otten, Martina; Plath, Peter; Walter, Helmut; Westphalen, Karl-Otto; and Misslitz, Ulf, 6,040,274, Cl. 504-348.000.
Telser, Thomas; Huemmer, Wolfgang; and Kurtz, Karl-Rudolf, 6,040,116, Cl. 430-306.000.
Vogelbacher, Uwe Josef; Keil, Michael; Klintz, Ralf; Wahl, Josef; Wingert, Horst; König, Hartmann; Rack, Michael; Götz, Roland; and Teles, Joaquim Henrique, 6,040,458, Cl. 548-371.100.
BASF Corporation: *See*—
Fishback, Thomas L.; Heyman, Duane A.; Reichel, Curtis J.; and Jaglowski, Adam J., 6,040,413, Cl. 528-44.000.
Kent, Diane R.; Hoyt, Matthew B.; Ilg, Otto M.; and Queen, Morris K., 6,039,903, Cl. 264-40.100.
McGee, John D.; Campbell, Donald H.; and Rehfuss, John W., 6,040,062, Cl. 428-500.000.
Menovcik, Gregory G.; Balch, Thomas C.; Davis, Hilary P.; and Dudek, Paul, 6,040,360, Cl. 523-206.000.
Bashlov, Nikolai L.; Vul, Alexandr Y.; Kidalov, Sergei V.; Kozyrev, Sergei; Milenin, Vyacheslav M.; and Timofeev, Nikolai A., to Aktsionernoe Obschestvo Zakkytogo Tipa Nauchno-Tekhniches Koe Agentstvo "Intelleki". Discharge lamp with HO radicals as radiating additives. 6,040,658, Cl. 313-637.000.
Bass, Brian Mitchell; Hubbard, James Allison; Oman, Price Ward; and Pita, Frank J., to International Business Machines Corporation. Method and system for enabling nondisruptive live insertion and removal of feature cards in a computer system. 6,041,375, Cl. 710-103.000.
Bass, Edward R.; Kodonas, Konstantin G.; and Weis, Vincent R., to Pitney Bowes Inc. Method and system for telephone updates of postal scales. 6,041,319, Cl. 705-409.000.
Bass, Steven: *See*—
Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 6,040,136, Cl. 435-5.000.
Bassett, Michael L.; Batterton, Gregory W.; and Szadkowski, Andrzej P., to Eaton Corporation. Clutch friction disc balancing method. 6,039,163, Cl. 192-110.00R.
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Batcho, Andrew David; Manchand, Percy Sarwood; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc.; and Syntex (U.S.A.). Synthesis of 3-epi vitamin D_3 metabolites and analogs. 6,040,461, Cl. 549-332.000.
Bates, Ray G., Jr.; Deweese, Robert M., Jr.; and Burns, John A., to Murray, Inc. Device for leveling a mower deck. 6,038,841, Cl. 56-15.800.
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Aldcroft, Derek; Bates, Sharron; and Earl, Graham James, 6,039,798, Cl. 106-272.000.
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Ammann, Klaus; and Bäther, Wolfgang, 6,040,777, Cl. 340-632.000.
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Batlaw, Rajnish: *See*—
Harris, Philip G.; and Batlaw, Rajnish, 6,040,482, Cl. 564-443.000.
Batstone, Druce Barry: *See*—
Hatt, Raymond John; Wilson, David John; and Batstone, Druce Barry, 6,039,276, Cl. 241-30.000.
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John, Thomas; Kuhn, Thomas; and Nehse, Wolfgang, 6,041,276, Cl. 701-67.000.

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Chwalisz, Krzysztof; and Garfield, Robert E., 6,040,340, Cl. 514-509.000.

Board of Trustees Leland Stanford Junior University: *See*—
Hodgson, Craig W.; Wagener, Jefferson L.; Digonnet, Michel J. F.; and Shaw, H. John, 6,040,571, Cl. 250-227.140.

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Hollingsworth, Rawle I.; and Wang, Guijun, 6,040,464, Cl. 549-451.000.

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Pooley, Michael B.; Strotton, Carl N.; and Wardle, David G., 6,038,868, Cl. 62-63.000.

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Thielert, Wolfgang; Bohne, Gerhard; and Müller, Klaus-Helmut, 6,040,271, Cl. 504-134.000.

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Boles, Timothy Edward, to Whitaker Corporation, The. Method of fabricating polysilicon based resistors in Si-Ge heterojunction devices. 6,040,225, Cl. 438-314.000.

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Van De Venne, Gunter; Kemmerling, Frank; Bonse, Michael; Muckelmann, Klaus; and Peters, Rainer, 6,039,536, Cl. 415-216.100.

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Qin, Si-Zhao Joe; and Borders, Guy Thompson, 6,041,320, Cl. 706-1.000.

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Pentti, Ismo; and Leskinen, Pauli, 6,040,260, Cl. 502-103.000.

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Sullivan, Joseph L.; Borschowa, Lawrence A.; and Nova, Richard C., 6,041,254, Cl. 607-5.000.

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Bortz, Michael L.; and Godil, Asif A., to New Focus, Inc. Simple, low cost, laser absorption sensor system. 6,040,914, Cl. 356-435.000.

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Boston, Joseph F.; and Boys, Ian, to Aspen Technology, Inc. Method and apparatus for simulating and optimizing a plant model. 6,041,263, Cl. 700-32.000.

Botich, Michael J.; Halseth, Thor R.; and Barker, John, to MDC Investment Holdings, Inc. Pre-filled retractable needle injection device. 6,039,713, Cl. 604-110.000.

Botka, Christopher M.: *See*—
Nordquist, Jack; Calahan, Mark J.; Damiano, Timothy J.; and Botka, Christopher M., 6,040,676, Cl. 318-696.000.

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Boucher, Raymond M. G. Liquid phase disinfection/sterilization with microwave energy. 6,039,921, Cl. 422-21.000.

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Gilbert, Richard; Sauvageau, Mario A.; and Bourgeois, Stephane, 6,038,920, Cl. 73-170.230.

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Bova, G. Steven. Laser cell purification system. 6,040,139, Cl. 435-6.000.

Bowers, Debra D.: *See—*
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Boyes, Geoffrey E.; and Herlant, Michel A., to Equistar Chemicals, LP. Blended dyes and process for dyeing polypropylene fibers. 6,039,767, Cl. 8-400.000.

Boys, Ian: *See—*
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Bozso, Ferenc Miklos; and Emma, Philip George, to International Business Machines Corporation. Clock skew minimization and method for integrated circuits. 6,040,203, Cl. 438-106.000.

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Fougret, Christoph Martin; and Holderich, Wolfgang Friederich, 6,040,262, Cl. 502-162.000.
Jobson, Simon; and Watson, Derrick John, 6,040,474, Cl. 560-243.000.

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Mehra, Dev K.; Ramireddy, Chittamuru; Tang, Li-Juan; and Porter, Stuart C., 6,039,976, Cl. 424-480.000.

Bracco Research USA: *See—*
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Bradbury, John R.: *See—*
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Brady, James T., to International Business Machines Corporation. Method and apparatus for determining a routing table for each node in a distributed nodal system. 6,041,049, Cl. 370-351.000.

Brady, Jerry L.: *See—*
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Bran, Mario E., to Verteq, Inc. Wafer cleaning system. 6,039,059, Cl. 134-105.000.

Brandon, Giles M.: *See—*
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Braun, Morris, to Kenall Manufacturing Co. Method and apparatus for securing the same hinged lid assembly to each of a plurality of different containers. 6,039,197, Cl. 215-228.000.

Braunberger, Benjamin A., to Tecre Company, Inc. Apparatus for manufacturing buttons. 6,038,944, Cl. 79-4.000.

Breda, Jean-Marc, to Sextant Avionique. Optical velocimetric probe. 6,040,899, Cl. 356-28.500.

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Breen, Philip: *See—*
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Bregengaard, Claus: *See—*
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Breidenbach, Paul, to General Motors Corporation. Valve drive arrangement for internal combustion engines. 6,039,019, Cl. 123-90.610.

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Haehnel, Thomas; Breitlow-Hertzfeldt, Juergen; Saffian, Bernd; and Kern, Josef, 6,040,751, Cl. 335-185.000.

Breme, Jürgen: *See—*
Hegner, Frank; Schmidt, Elke Maria; Güther, Volker; Otto, Andreas; Breme, Jürgen; Müller, Heinz; and Turnsek, Jürgen Peter, 6,039,918, Cl. 420-422.000.

Brennan, Thomas C., to International Business Machines Corporation. Method and apparatus for performing integrated circuit timing including noise. 6,041,169, Cl. 395-500.070.

Breslin, Daniel V. Pen. 6,039,486, Cl. 401-88.000.

Bretschneider, Richard; Siu, Burton; and Qureshi, Imran Iqbal, to Microsoft Corporation. Method and apparatus for automatically updating a data file from a network. 6,041,333, Cl. 707-203.000.

Brew, Thomas W.; and Kragle, Harry A., to Corning Incorporated. Method for honeycomb extrusion using a corrected flow gradient. 6,039,908, Cl. 264-177.120.

Brewer, George J.: *See—*
Venta, Patrick J.; Brewer, George J.; Yuzbasiyan-Gurkan, Vilma; and Schall, William D., 6,040,143, Cl. 435-6.000.

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Brickner, Louis C., Jr.; and Wixey, Barry D., to Delta International Machinery Corp. Composite material C-arm for scroll saw. 6,038,953, Cl. 83-783.000.

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Kurata, Tomoyuki; Kumano, Youichi; and Takahashi, Kazuya, 6,039,405, Cl. 301-43.000.
Siegenthaler, Karl J., 6,039,825, Cl. 156-111.000.

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Kasashima, Atsuki; Ihara, Keisuke; and Shimosaka, Hirotaka, 6,039,660, Cl. 473-378.000.

Bries, James L.: *See—*
Sadrakula, Philip V.; Kampa, Leonard; Hamerski, Michael D.; and Bries, James L., 6,039,102, Cl. 156-510.000.

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Ridker, Paul; and Hennekens, Charles H., 6,040,147, Cl. 435-7.240.

Brinsea Products, Inc.: *See—*
Pearce, Frank H., 6,039,006, Cl. 119-315.000.

Bristol Compressors, Inc.: *See—*
Monk, David T.; Hill, Joe T.; Wagner, Phillip C.; Loprete, Joseph F.; and Young, Michael R., 6,040,679, Cl. 318-778.000.

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Kim, Kyoung S.; Kimball, S. David; Cai, Zhen-wei; Rawlins, David B.; Misra, Raj N.; Poss, Michael A.; Webster, Kevin R.; Hunt, John T.; and Han, Wen-Ching, 6,040,321, Cl. 514-369.000.

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Kashyap, Raman; and Armitage, Jonathan Richard, 6,041,069, Cl. 372-6.000.

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Britton, Rick A. Communication path integrity supervision in a network system for automatic alarm data communication. 6,040,770, Cl. 340-539.000.

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Broder, Christopher C.: *See—*
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Brokaw, A. Paul, to Analog Devices, Inc. Switched-transconductance circuit within integrated T-switches. 6,040,732, Cl. 327-408.000.

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Brooks, Dennis L.: *See—*
Quiachon, Dignah B.; Gandhi, Deepak R.; Brooks, Dennis L.; Imran, Mir A.; and Guidi, Roger J., 6,039,743, Cl. 606-108.000.

Broome, Barry G., to Intel Corporation. Athermalized mounts for lenses. 6,040,950, Cl. 359-820.000.

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Scheck, Georg; Klippert, Uwe; and Brandt, Carsten, 6,038,817, Cl. 49-352.000.

Brost, Wolfgang: *See—*
Buck, Manfred; Brost, Wolfgang; Handschuh, Robert; and Kratt, Helmut, 6,039,038, Cl. 125-39.000.

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Kato, Hiroyuki; and Sasa, Masahiko, 6,041,119, Cl. 379-424.000.
Suzuki, Tsutomu; Sato, Shougo; and Okabe, Yasushi, 6,041,203, Cl. 399-111.000.

Brow, Karenann: *See—*
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Brown, Cary Lee; Hartsfield, Richard C.; Harter, Bernard Gerald; and Schoolcraft, Brian, to Emerson Electric Co. Electromagnetic device having encapsulated construction and precise positioning of bearing and shaft axes. 6,040,647, Cl. 310-89.000.

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Brown, Dana Henry; Christensen, Thomas Charles; Cunningham, Earl A.; and Rogelstad, Wayne A., to International Business Machines Corporation. Self servo writing file. 6,040,955, Cl. 360-75.000.

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Lockhart, David J.; Brown, Eugene L.; Wong, Gordon G.; Chee, Mark S.; and Gingeras, Thomas R., 6,040,138, Cl. 435-6.000.

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Sanders, Marcus Maria; Kapitan, John Mark; and Brown, Henry John Harding, 6,039,738, Cl. 606-61.000.

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Brown, Joseph D.: *See—*
Wharton, Robert J.; Daniel, Eric R.; and Brown, Joseph D., 6,040,530, Cl. 174-261.000.

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Brück, Rolf; and Hirth, Peter, to Emitec Gesellschaft fuer Emissionstechnologies mbH. Honeycomb body with thermal insulation, preferably for an exhaust gas catalytic converter. 6,040,064, Cl. 428-593.000.

Brueckner, Reinhard: *See—*
David, Samuel; Antel, Jochen; Brueckner, Reinhard; Ziegler, Dieter; Eeckhout, Christian; Bielenberg, Gerhard-Wilhelm; and Peck, Michael, 6,040,303, Cl. 514-218.000.

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Bruner, Rodney William; and Wilkie, William Edward, II, to Eaton Corporation. Switchgear conductors and mounting arrangements therefor. 6,040,976, Cl. 361-611.000.

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Bruns, Donald G., to Thermotrex Corporation. Linear actuator. 6,040,643, Cl. 310-26.000.

Brusasco, Raymond M.: *See—*
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Bruun, Anders. Water resistant file cabinets. 6,039,415, Cl. 312-229.000.

BSH Bosch und Siemens Hausgeraete GmbH: *See—*
Hirath, Jürgen; and Schütte, Markus, 6,038,830, Cl. 52-788.100.

BTG International Inc.: *See—*
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BTR Sealing Systems Technical Center, Inc.: *See—*
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Buchko, Christopher J.: *See—*
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Coulonvaux, Paul R., to Donaldson Company, Inc. Air cleaner assembly. 6,039,778, Cl. 55-498.000.

Coulthard, Steve M. Portable emergency response communications system and method. 6,041,242, Cl. 455-575.000.

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Koshy, Jacob; Thomas, Jijimon Kumpukkattu; Kurian, Jose; Yadava, Yogendra Prasad; and Damodaran, Alathoor Damodaran, 6,040,275, Cl. 505-471.000.

Courault, Jacques, to Alstom. Practical structure for making a multilevel converter. 6,040,990, Cl. 363-59.000.

Cousin, Gérard: *See—*
Gendrot, Edouard; Cousin, Gérard; Ragot, Françoise; and Clee-Bouvet, Marie-Christine, 6,039,979, Cl. 424-497.000.

Covino, Josephine: *See—*
Lee, Ilzoo; and Covino, Josephine, 6,039,929, Cl. 423-328.200.

Cowan, Michael R.: *See—*
Tucker, Sean W.; Cowan, Michael R.; and Martin, Mark P., 6,039,241, Cl. 228-264.000.

Cowan, Stanley W.: *See—*
Tang, Ping-Wah; Lussier, Barbara B.; and Cowan, Stanley W., 6,040,126, Cl. 430-557.000.

Cowater International Inc.: *See—*
Baron, Mark J., 6,038,710, Cl. 4-321.000.

Cowsert, Lex M., to Isis Pharmaceuticals Inc. Antisense inhibition of G-alpha-i2 expression. 6,040,179, Cl. 435-375.000.

Cowsert, Lex M.: *See—*
Monia, Brett P.; and Cowsert, Lex M., 6,040,178, Cl. 435-375.000.

Cox, Brian Geoffrey; and Gray, Thomas, to Zeneca Limited. Process for making benzisothiazolin-3-ones. 6,040,452, Cl. 548-209.000.

Cox, James Stacy, to LAP Licensing, LC. Litter box cleaning system, components and method. 6,039,003, Cl. 119-166.000.

Cox, Kenneth C.: *See—*
Riego, Domingo C.; Cox, Kenneth C.; Sexton, Franklin E.; and Meadows, James C., 6,040,272, Cl. 504-206.000.

Cracauer, Raymond F.; and Michels, Lester D., to Novartis Nutrition AG. Collapsible retention bolster for gastrostomy and other ostomy tubes. 6,039,714, Cl. 604-174.000.

Cramer, Margaret D., to IMO Industries, Inc. Method of making composite barrier can for a magnetic coupling by filament winding. 6,039,827, Cl. 156-173.000.

Cranford, Mike: *See—*
Roussel, Patrice; Chennupaty, Srinivas; Cranford, Mike; Abdallah, Mohammad; Coke, Jim; and Kong, Katherine, 6,041,404, Cl. 712-210.000.

Crave, Joël: *See—*
Mangano, Alain; Allart, Bernard; Bigo, Louis; Garczarek, Michel; Ethet, Yannick; Crave, Joël; and Peignon, Philippe, 6,038,859, Cl. 60-436.000.

Crawford, Michael K.; and Killian, James M. Pelvic support and walking assistance device. 6,039,707, Cl. 602-5.000.

Cray Valley S.A: *See—*
Iliopoulos, Ilias; Lafuma, Francoise; Gillet, Jean-Philippe; and Pezron, Erwoan, 6,040,386, Cl. 525-329.900.

Credence Systems Corporation: *See—*
Berar, Andrei, 6,040,700, Cl. 324-754.000.
Hanners, John C.; Miller, Charles A.; and Stanford, Dean, 6,040,691, Cl. 324-158.100.

Creel, Michael Loren: *See—*
Einziger, William Louis; Eckels, Phillip William; and Creel, Michael Loren, 6,038,867, Cl. 62-45.100.

Crescentini, Lynda N. Helmet with opaque inner layer, translucent outer layer, and patterning therebetween. 6,038,704, Cl. 2-410.000.

Crespi, Ann M.: *See—*
Haas, David P.; Howard, William G.; Crespi, Ann M.; Rorvick, Anthony R.; Rockow, Steven; and Ries, Andrew J., 6,040,082, Cl. 429-163.000.

Cretois, Isabelle: *See—*
Samain, Henri; and Cretois, Isabelle, 6,039,933, Cl. 424-47.000.

Crewdson, Bernard John, to Imperial Chemical Industries PLC. Heat exchange catalytic reactor. 6,039,113, Cl. 165-159.000.

Crisci, Frances E. Bicycle cover with an attachable alarm system. 6,040,764, Cl. 340-432.000.

Croce, Carlo; and Canaani, Eli, to Thomas Jefferson University. Methods for screening and treating leukemias resulting from all-1 region chromosome abnormalities. 6,040,140, Cl. 435-6.000.

Crone, Aaron D.: *See—*
Holowko, Paul L.; and Crone, Aaron D., 6,039,251, Cl. 235-380.000.

Cronin, John E.: *See—*
Canale, Anthony J.; and Cronin, John E., 6,040,213, Cl. 438-243.000.

Crosfield Limited: *See—*
Aldcroft, Derek; Bates, Sharron; and Earl, Graham James, 6,039,798, Cl. 106-272.000.

Crossroads Systems, Inc.: *See—*
Hoese, Geoffrey B., 6,041,381, Cl. 710-129.000.

Crots, David E.: *See—*
Hartman, Terry E.; Kroh, Herbert C.; and Crots, David E., 6,038,889, Cl. 65-319.000.

Croughan, Louise: *See—*
Jellema, Bart; Peeren, René; Croughan, Louise; and Aben, Freek, 6,041,115, Cl. 379-230.000.

Crow, Steve A. Method of supporting a pair of eyeglasses. 6,039,173, Cl. 206-5.000.

Crowley, Todd A.: *See—*
Jeffords, Jason; Crowley, Todd A.; and Dev, Roger, 6,041,383, Cl. 710-200.000.

Croy, Clemens; and Bermbach, Rainer F.R. Personal navigator system. 6,040,829, Cl. 345-327.000.

Crum, Joseph Arden: *See—*
Chagnot, Catherine J.; and Crum, Joseph Arden, 6,039,109, Cl. 165-8.000.

CSB-System Software-Entwicklung & Unternehmensberatung GmbH: *See—*
Schimitzek, Peter, 6,041,289, Cl. 702-187.000.

Csipkes, Andrei: *See—*
Chandler, William Keith; Shah, Nadir; Mahmood, Waqar; and Csipkes, Andrei, 6,039,630, Cl. 451-6.000.

CTI Pet Systems, Inc.: *See—*
Watson, Charles C.; and Jones, William F., 6,040,580, Cl. 250-363.030.

CTS: *See—*
Seffernick, Lewis L.; and Poole, David L., 6,040,823, Cl. 345-168.000.

CTS Corproation: *See—*
Kaijala, Murray, 6,040,756, Cl. 338-160.000.

Cu Chemie Uetikon GmbH: *See—*
Steiner, Klaus; Gangkofner, Stefan; and Grunenwald, Jean-Marie, 6,040,479, Cl. 564-304.000.

Cuerrier, Gilles. Scent dispenser. 6,038,804, Cl. 43-1.000.

Culbertson, Russell D., to Wabuco. Bicycle saddle. 6,039,395, Cl. 297-202.000.

Cullen, Michael John; Tonkin, John Phillip; and Ferch, Eric Blaine, to Ford Global Technologies, Inc. Air control system. 6,039,023, Cl. 123-339.230.

Cummings, Bruce, to Colgate-Palmolive Company. Positive displacement multichamber pump dispenser. 6,039,216, Cl. 222-137.000.

Cummings, Tom; Nowak, David; and Chang, Byung Jin, to General Scientific Corporation. Compact high-intensity lighting assembly. 6,039,461, Cl. 362-287.000.

Cummins-Allison Corp.: *See*—
Geib, Joseph J.; Casanova, Scott D.; Mennie, Douglas U.; Mazur, Richard A.; and Watts, Gary P., 6,039,644, Cl. 453-10.000.
Mazur, Richard A., 6,039,645, Cl. 453-10.000.

Cunningham, April: *See*—
Lazo, John S.; Rice, Robert L.; Cunningham, April; and Wipf, Peter, 6,040,323, Cl. 514-374.000.

Cunningham, Charles L.; and Gwaltney, Robert E., to Hennessy Industries, Inc. Dual purpose clamp for rim holding tire changers. 6,039,104, Cl. 157-21.000.

Cunningham, Earl A.: *See*—
Brown, Dana Henry; Christensen, Thomas Charles; Cunningham, Earl A.; and Rogelstad, Wayne A., 6,040,955, Cl. 360-75.000.

Cunningham, Robert J., to Raytheon Company. Snap-fit design of an airborne missile systems seeker/detector section using engineering plastics. 6,040,523, Cl. 174-35.00R.

Cupferman, Sylvie; and Laugier, Jean-Pierre, to Societe L'Oreal S.A. Treatment of seborrhoea/cutaneous disorders with octoxyglycerol. 6,040,347, Cl. 514-723.000.

Curtis, Nicholas J.: *See*—
Aldridge, Donald; and Curtis, Nicholas J., 6,038,700, Cl. 2-81.000.

Cusanelli, Dominic S.: *See*—
Karafiath, Gabor; and Cusanelli, Dominic S., 6,038,995, Cl. 114-271.000.

Cutler, Stanley; Gerth, Gayle B.; Otis, Alton B., Jr.; and Chau, Taylor, to JB Research, Inc. Microcontroller based massage system. 6,039,702, Cl. 601-15.000.

CVC Products, Inc.: *See*—
Moslehi, Mehrdad M.; Davis, Cecil J.; and Heimanson, Dorian, 6,039,848, Cl. 204-192.120.

Cybernet Systems Corporation: *See*—
Chen, Xiaolu, 6,040,900, Cl. 356-35.500.

Cynosure, Inc.: *See*—
Durville, Frederick M.; Connolly, Raymond J; Lantis, John C; Rediker, Robert H; and Schwaitzberg, Steven D., 6,039,729, Cl. 606-16.000.

Cypress Semiconductor Corporation: *See*—
Anumula, Sudhaker Reddy; and Wu, Ping, 6,041,388, Cl. 711-100.000.

CYTEC Technology Corp.: *See*—
Davies, William Bloor; Healy, John Edward; Miller, Gary Kaui Lani; Kozakiewicz, Joseph J.; and Ryles, Roderick G., 6,039,881, Cl. 210-732.000.
Mallon, Joseph J.; Farinato, Raymond S.; Rosati, Louis; and Freeman, John J., Jr., 6,040,376, Cl. 524-547.000.

Daberkow, Andreas; Krause, Ralf; Ott, Norbert; and Krouzilek, Rolf, to Daimler-Benz Aktiengesellschaft; and ABB Daimler-Benz Aktiengesellschaft. Two-wheeled bogie for track-guided vehicles. 6,038,981, Cl. 105-168.000.

Dabrowski, Laurent, to Valeo Thermique Moteur. Air-conditioning condenser provided with an exchangeable fluid reservoir. 6,038,884, Cl. 62-509.000.

Dack, Kevin Neil; and Dickinson, Roger Peter, to Pfizer, Inc. Benzothiophene derivatives useful in therapy. 6,040,309, Cl. 514-253.000.

Daewoo Electronics Co., Ltd.: *See*—
Jin, Sang-Hun, 6,041,268, Cl. 700-107.000.
Oh, Min-Jung, 6,038,880, Cl. 62-408.000.

Daewoo Heavy Industries America Corporation: *See*—
Cherry, Wesley Robert, Jr., 6,041,163, Cl. 388-811.000.

Daewoo Heavy Industries Ltd.: *See*—
Cherry, Wesley Robert, Jr., 6,041,163, Cl. 388-811.000.

Daewoo Motor Co, Ltd.: *See*—
Lee, Jeong-Ki, 6,039,777, Cl. 55-385.300.

Daewoo Motor Co., Ltd.: *See*—
Kim, Kyung Woon; and Lee, Hong Cheol, 6,039,033, Cl. 123-568.170.

Daewoo Telecom, Ltd.: *See*—
Brewster, John; and Ulema, Mehmet, 6,041,108, Cl. 379-196.000.

Dagens, Béatrice: *See*—
Goldstein, Léon; Leclerc, Denis; and Dagens, Béatrice, 6,040,246, Cl. 438-706.000.

Dai, Chang-Ming: *See*—
Gau, Tsai-Sheng; and Dai, Chang-Ming, 6,040,119, Cl. 430-330.000.

Dai Nippon Printing Co., Ltd.: *See*—
Imoto, Kazunobu; Oshima, Katsuyuki; and Nishikawa, Hideki, 6,040,269, Cl. 503-227.000.
Kanki, Masahiro; Kawano, Mutsuhiro; and Matano, Takashi, 6,040,356, Cl. 523-160.000.
Takahashi, Kazuhiro; Kobayashi, Toshitake; Takemoto, Masataka; Matano, Takashi; and Ono, Haruo, 6,040,044, Cl. 428-323.000.
Ueno, Takeshi; Kita, Tatsuya; and Shibasaki, Naoji, 6,040,268, Cl. 503-227.000.
Yamashita, Rikiya, 6,040,047, Cl. 428-343.000.

Daiber, Andrew J.: *See*—
Heanue, John F.; Daiber, Andrew J.; and Colvin, James, 6,040,930, Cl. 359-21.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Kishino, Katsumi; and Kato, Toshihiro, 6,040,587, Cl. 257-11.000.
Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, 6,039,919, Cl. 420-446.000.

Daikin Industries, Ltd.: *See*—
Okamoto, Masakazu; and Kurihara, Toshiyuki, 6,038,866, Cl. 62-6.000.

Daimler - Benz Aktiengesellschaft: *See*—
Becker, Klaus; Staiger, Wolfgang; Jung, Matthias; and Heinemeyer, Peter, 6,039,114, Cl. 165-170.000.
Daberkow, Andreas; Krause, Ralf; Ott, Norbert; and Krouzilek, Rolf, 6,038,981, Cl. 105-168.000.

Daimler Chrysler AG: *See*—
Wandel, Hermann; Jost, Michael; Sommer, Helmut; and Fischer-Wilk, Robert, 6,038,932, Cl. 73-861.650.

DaimlerChrysler: *See*—
Hoger, Heinz; and Rath, Andreas, 6,038,740, Cl. 16-382.000.

DaimlerChrysler AG: *See*—
Bonny, Pierre; Kreutzig, Norbert; and Sternal, Thorsten, 6,038,769, Cl. 29-890.080.
Eckstein, Lutz; and Reichelt, Werner, 6,039,142, Cl. 180-333.000.
Griesinger, Manfred, 6,040,916, Cl. 356-448.000.
Hofele, Franz-Xaver, 6,040,797, Cl. 342-159.000.
Jambor, Arno; and Wagner, Oliver, 6,039,383, Cl. 296-108.000.
Patzelt, Helmut; and Schremmer, Gottfried, 6,039,350, Cl. 280-775.000.

DaimlerChrysler Corporation: *See*—
Dourra, Hussein; Holbrook, Gerald L.; Correa, Colt R.; and Parenti, David, 6,039,674, Cl. 477-166.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Matsushita, Masanao; and Taniguchi, Hideyuki, 6,040,120, Cl. 430-347.000.

Daishin Frame Inc.: *See*—
Sakurai, Yasuo, 6,041,305, Cl. 705-5.000.

Dalal, Kirit; Köhler, Ekkehard; and Nadkarni, Anil V., to Bleistahl Produktions-GmbH & Co. KG; and SCM Metal Products, Inc. Material for the powder-metallurgical production of shaped parts, in particular valve seat rings or valve guides with high resistance to wear. 6,039,785, Cl. 75-235.000.

Dalal, Siddhartha R.: *See*—
Carman, David; Dalal, Siddhartha R.; Jain, Ashish; and Karunanithi, Nachimuthu, 6,041,330, Cl. 707-101.000.

Dalgleish, David Thomson; and Sands, Matthew Richard, to Arjobex Limited. Composite plastics film or sheet. 6,040,042, Cl. 428-308.400.

Dallas, Milton R., Jr.; and Randall, Jeffrey T., to Aptar Group, Inc. Multiple-orifice dispensing system with improved seal. 6,039,224, Cl. 222-565.000.

Dalley, James Edward Joseph: *See*—
Smith, Martin Stevens; Smith, Adrian David; Dalley, James Edward Joseph; and McKenna, Stephen John, 6,040,802, Cl. 343-700.0MS.

Damask, John E. Bulk load dispenser and method. 6,039,223, Cl. 222-389.000.

Damiano, Timothy J.: *See*—
Nordquist, Jack; Calahan, Mark J.; Damiano, Timothy J.; and Botka, Christopher M., 6,040,676, Cl. 318-696.000.

Damme, Eric; Gilson, Jean-Marc; Leempoel, Patrick; Lebecq, Fabrice; and Takemasa, Takao, to Dow Corning S.A. Process for preparing chain-extended organopolysiloxanes. 6,040,412, Cl. 528-34.000.

Damodaran, Alathoor Damodaran: *See*—
Koshy, Jacob; Thomas, Jijimon Kumpukkattu; Kurian, Jose; Yadava, Yogendra Prasad; and Damodaran, Alathoor Damodaran, 6,040,275, Cl. 505-471.000.

Danek, Magnus: *See*—
Öhlin, Kenth; and Danek, Magnus, 6,039,159, Cl. 188-322.150.

Danford-Klein, Henrik; and Kring, John, to Schneider National, Inc. Object oriented rating system and method. 6,041,318, Cl. 705-400.000.

Dang, Chi-Hung: *See*—
Hammar, Jerry Walter; Kulakowski, John Edward; Means, Rodney Jerome; and Dang, Chi-Hung, 6,041,026, Cl. 369-36.000.

Dangat, Geetaram S.; Milne, Robert J.; and Orzell, Robert A., to International Business Machines Corporation. Method to provide common support for multiple types of solvers for matching assets with demand in microelectronics manufacturing. 6,041,267, Cl. 700-107.000.

Daniel, Eric R.: *See*—
Wharton, Robert J.; Daniel, Eric R.; and Brown, Joseph D., 6,040,530, Cl. 174-261.000.

Danieli & C. Officine Meccaniche SpA: *See*—
Alfredo, Poloni, 6,038,951, Cl. 83-105.000.
Cherubini, Mario, 6,038,905, Cl. 72-239.000.

Danielson, Arvin D.: *See*—
Durbin, Dennis A.; and Danielson, Arvin D., 6,039,258, Cl. 235-472.010.

Danielson, Robert B.; and Meisinger, Stanlee W., to FasTest, Inc. High pressure fluidline connector. 6,039,303, Cl. 251-149.600.

Danzyger, Howard L.; Brow, Karenann; Caruso, James; Hibbard, Timothy; McPhilliamy, Steven; and Thuma, Michael, to Fellowes Manufacturing Co. Wrist rest assembly. 6,039,292, Cl. 248-118.500.

Darwin, Robert L.: *See*—
Bowman, Howard L.; Darwin, Robert L.; Maraffio, William M.; Sawyer, Larry D.; Williams, Robert B.; Hudson, Frank E.; Hunstad, Mary; and Decker, Mark W., 6,039,124, Cl. 169-61.000.

Das, Nripendra N.: *See*—
Mantkowski, Thomas E.; Das, Nripendra N.; Heidorn, Raymond W.; and King, Jackie L., 6,039,810, Cl. 118-715.000.

Dassel, Mark W.: *See*—
Rostami, Ader M.; DeCoster, David C.; Vassiliou, Eustathios; and Dassel, Mark W., 6,039,902, Cl. 264-37.180.

Datalink Systems Corporation: *See*—
Miller, Nicholas R., 6,040,784, Cl. 340-825.440.

Datcuk, Peter, Jr.; and Duarte, Lou. Push button click mechanism. 6,039,279, Cl. 242-296.000.

Datex-Ohmeda, Inc.: *See*—
Wilke, Thomas A.; and Wang, Ziyi, 6,039,697, Cl. 600-532.000.

Dauksher, William Joseph: *See*—

Mangat, Pawitter Jit Singh; Seese, Philip Armin; and Dauksher, William Joseph, 6,039,835, Cl. 156-345.000.

Dauth, Jochen; Hierstetter, Thomas; Deubzer, Bernward; and Gratzl, Petra, to Wacker-Chemie GmbH. Organosilicon compounds containing oligoisobutylene or polyisobutylene groups. 6,040,383, Cl. 525-100.000.

David, Samuel; Antel, Jochen; Brueckner, Reinhard; Ziegler, Dieter; Eeckhout, Christian; Bielenberg, Gerhard-Wilhelm; and Peck, Michael, to Solvay Pharmaceuticals GmbH. 7-phenyl-1, 4-diazepane compounds, process for their preparation, and pharmaceutical compositions containing them. 6,040,303, Cl. 514-218.000.

Davidovici, Sorin; Tran, Jimmy Cuong; and Kanterakis, Emmanuel, to Golden Bridge Technology, Inc. Multi-clock matched filter for receiving signals with multipath. 6,041,073, Cl. 375-148.000.

Davidsen, Richard E.: *See*—
Walker, William F.; Toth, Cynthia A.; and Davidsen, Richard E., 6,039,691, Cl. 600-452.000.

Davidson, Steven Frederic; Vollendorf, Kim David; DiCicco, Michael Frank; Collar, Stuart John; and Stone, Jeffrey Jay, to Northrop Grumman Corporation. Personal communications unit. 6,041,243, Cl. 455-575.000.

Davies, Ian W.; Journet, Michel; Gerena, Linda; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, to Merck & Co., Inc. Process for making diaryl pyridines useful as cox-2-inhibitors. 6,040,450, Cl. 546-256.000.

Davies, Ian W.: *See*—
Corley, Edward G.; Davies, Ian W.; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, 6,040,319, Cl. 514-334.000.

Davies, William Bloor; Healy, John Edward; Miller, Gary Kaui Lani; Kozakiewicz, Joseph J.; and Ryles, Roderick G., to CYTEC Technology Corp. Spray drying of polymer-containing dispersions, water-in-oil and water-in-oil microemulsions and dry polymer products formed thereby. 6,039,881, Cl. 210-732.000.

Davis, Cecil J.: *See*—
Moslehi, Mehrdad M.; Davis, Cecil J.; and Heimanson, Dorian, 6,039,848, Cl. 204-192.120.

Davis, Clark C.: *See*—
Jacobsen, Stephen C.; Davis, Clark C.; and Knutti, David F., 6,039,075, Cl. 137-625.280.

Davis, Hilary P.: *See*—
Menovcik, Gregory G.; Balch, Thomas C.; Davis, Hilary P.; and Dudek, Paul, 6,040,360, Cl. 523-206.000.

Davis, James Talmage, II: *See*—
Stanton, Stephen Millard; Davis, James Talmage, II; Dutson, Alan James; and Henderson, Gregory Lane, 6,040,846, Cl. 345-905.000.

Davis, James W.: *See*—
Du, Weimin; Davis, James W.; Pfeifer, Clemens; Shan, Ming-Chien; and Sheard, Nicolas, 6,041,306, Cl. 705-8.000.

Davis, John Gillette; Mays, Allen Thomas; and Slesinger, Kris Allen, to International Business Machines Corporation. Transfer fluxing method and apparatus for component placement on substrate. 6,039,805, Cl. 118-74.000.

Davis, John M.: *See*—
Jackson, Susan M.; Jackson, Robert A.; and Davis, John M., 6,040,772, Cl. 340-568.600.

Davis, Mark E.: *See*—
Yoshikawa, Masahito; and Davis, Mark E., 6,040,258, Cl. 502-64.000.

Davis, Walter Lee. Multiple account portable wireless financial messaging unit. 6,041,314, Cl. 705-41.000.

Davyduke, Roland: *See*—
Kennedy, Joe B.; Davyduke, Roland; Jackson, James G.; Hannebauer, James B.; Newnes, William R.; Stroud, Brian; and Sergeant, John, 6,039,097, Cl. 144-357.000.
Kennedy, Joe B.; Davyduke, Roland; Jackson, James G.; Hannebauer, James B.; Newnes, William R.; Stroud, Brian; and Sergeant, John, 6,039,098, Cl. 144-357.000.

Dawirs, Willis R., to United States of America, Navy. Low duty cycle navigation system. 6,040,801, Cl. 342-457.000.

Dawson, Fredric O. Dumbbell set with quick release plates. 6,039,678, Cl. 482-107.000.

Dawson, Gerald L.; and Redden, James P., to Mas-Hamilton Group, Inc. Back cover lock for a combination lock. 6,038,897, Cl. 70-303.00A.

Day, Charles E. Antacid co-polymer of guanidine and polyethylenimine. 6,040,315, Cl. 514-310.000.

Day, Grant P.: *See*—
Prasad, Arun; Karmaker, Ajit; Zammarieh, Elie; and Day, Grant P., 6,039,569, Cl. 433-180.000.

Day, Michael E. Surface referenced depth control. 6,039,518, Cl. 409-218.000.

Day, Roger William: *See*—
Papavassiliou, Vasilis; Wagner, Matthew Lincoln; and Day, Roger William, 6,040,467, Cl. 549-534.000.

Dayco Products, Inc.: *See*—
Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 6,039,082, Cl. 138-121.000.

DE NORA S.p.A.: *See*—
Federico, Fulvio, 6,039,852, Cl. 204-255.000.

Dean, Daniel R.; and DeCola, Charles R., to Dean, Daniel R. Paint brush and roller cleaning adapter. 6,038,787, Cl. 34-312.000.

Dean, Frank William, to Stoller Enterprises, Inc. Diformylurea and reaction products of urea and carboxylic acids. 6,040,273, Cl. 504-328.000.

DeAnna, Russell, to United States of America, Army. Passive bimetallic actuator for heat transfer. 6,039,262, Cl. 236-93.00R.

Deas, Alexander Roger, to Memory Corporation Technology Limited. Fault tolerant memory system. 6,041,422, Cl. 714-8.000.

Deason, Howard Thomas: *See*—
Trokhan, Paul Dennis; Phan, Dean Van; Deason, Howard Thomas; and Kleinwächter, Jörg, 6,039,839, Cl. 162-116.000.

Debe, Mark K.; Haugen, Gregory M.; Steinbach, Andrew J.; Thomas, John H., III; and Ziegler, Raymond J., to 3M Innovative Properties Company. Catalyst for membrane electrode assembly and method of making. 6,040,077, Cl. 429-40.000.

de Beijer, Justinus Lambertus Theodurus, to Hunter Douglas International N.V. Mounting system. 6,039,295, Cl. 248-262.000.

de Boer, Jacob; Hamming, Martin; and Goudsmits, Petrus J. M., to ODME International B.V. Device for processing a disc-shaped substrate as well as a station suitable for being coupled to such a device. 6,039,172, Cl. 198-750.100.

DeBoer, Kenneth Frank: *See*—
Sinnott, Robert A.; Clark, W. Dennis; and DeBoer, Kenneth Frank, 6,039,955, Cl. 424-195.100.

De Buyst, Jo; and Cardinaels, Jozef Renier Catharina, to Alcatel. Cable joint with grounding connection and/or screen cross-bonding for power cables. 6,040,527, Cl. 174-88.00C.

DEC International, Inc.: *See*—
Sanford, Scott A., 6,039,001, Cl. 119-14.470.

DeChant, Daniel A. Miniature golf bag travel organizer. 6,039,474, Cl. 383-66.000.

Decker, Mark R. Illuminated keyboard system. 6,040,822, Cl. 345-168.000.

Decker, Mark W.: *See*—
Bowman, Howard L.; Darwin, Robert L.; Maraffio, William M.; Sawyer, Larry D.; Williams, Robert B.; Hudson, Frank E.; Hunstad, Mary; and Decker, Mark W., 6,039,124, Cl. 169-61.000.

DeCola, Charles R.: *See*—
Dean, Daniel R.; and DeCola, Charles R., 6,038,787, Cl. 34-312.000.

Decolam, Inc.: *See*—
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Manlove, Gregory Jon; and Kearney, Mark Billings, 6,040,692, Cl. 324-173.000.

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Fujii, Nobuhiko; Nakada, Mitsuyuki; and Aoki, Kazuomi, 6,040,377, Cl. 524-571.000.

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Vondran, Gary L., Jr.; and Desoli, Giuseppe, 6,040,925, Cl. 358-525.000.

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Dev, Roger: *See—*
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Bates, Ray G., Jr.; Deweese, Robert M., Jr.; and Burns, John A., 6,038,841, Cl. 56-15.800.

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McLeod, Galvin Thomas, 6,039,129, Cl. 175-258.000.

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Dickinson, Gary: *See—*
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Symonds, Robert D.; Singer, Irek; St. George, Peter; and Gill, Robert Bradley, 6,039,245, Cl. 235-379.000.

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Law, Marcus Dixon; and Dietz, Jon M., 6,040,496, Cl. 800-280.000.

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Cleveland, Jason P.; and Anczykowski, Boris, 6,038,916, Cl. 73-105.000.

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Ghiam, Farid F.; and DiPoto, James P., 6,040,046, Cl. 428-343.000.

DiSalvo, Nicholas L., to Leviton Manufacturing Co., Inc. Reset lockout for circuit interrupting device. 6,040,967, Cl. 361-42.000.

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Earl, Patricia L.; Broder, Christopher C.; Doms, Robert W.; and Moss, Bernard, 6,039,957, Cl. 424-208.100.

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Marin, Michael L.; and Marin, Ralph, 6,039,749, Cl. 606-198.000.
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Hegner, Frank; Schmidt, Elke Maria; Güther, Volker; Otto, Andreas; Breme, Jürgen; Müller, Heinz; and Turnsek, Jürgen Peter, 6,039,918, Cl. 420-422.000.
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Jackson, Sherry D., 6,040,333, Cl. 514-456.000.
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Eppich, Stefan, 6,039,559, Cl. 425-574.000.
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Di Nardi, Peter C., 6,039,636, Cl. 451-178.000.
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Persson, Bror, 6,038,717, Cl. 5-607.000.
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Miles, Mark W., 6,040,937, Cl. 359-291.000.
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Bansemir, Horst, 6,039,538, Cl. 416-134.00A.
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Stewart, Francis, 6,040,430, Cl. 530-358.000.
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Hsu, Shi-Ping; Ling, James M.; Messenger, Arthur F.; and Evans, Bruce W., 6,041,410, Cl. 713-186.000.
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Watson, Fred W.; Hannock, Wayne; Lam, Robert; and Evans, George, 6,038,979, Cl. 102-481.000.
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Douglas, Peter; Dudik, Evan; Evans, John; and Kritzer, Alan, 6,039,688, Cl. 600-300.000.
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Burns, Clay Allen; Nielsen, Peter Madelaire; Sullivan, John Aloysius; and Sullivan, Frederic Ballou-Viaux, 6,039,329, Cl. 280-11.190.
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Aisenberg, Sol; Freedman, George; Hed, A. Ze'ev; and Pavelle, Richard, 6,038,786, Cl. 34-267.000.
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Mohr, Gary David; and Verduijn, Johannes Petrus, 6,039,864, Cl. 208-134.000.
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Kim, Hyun-Chul, 6,040,212, Cl. 438-242.000.
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Fanuc Ltd: *See*—
Terada, Akihiro; and Okuda, Mitsuhiro, 6,040,554, Cl. 219-124.340.
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Danzyger, Howard L.; Brow, Karenann; Caruso, James; Hibbard, Timothy; McPhilliamy, Steven; and Thuma, Michael, 6,039,292, Cl. 248-118.500.

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Stoll, Kurt; Berger, Rolf; and Gebauer, Günter, 6,039,358, Cl. 285-23.000.

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Field Management Services, Inc.: *See*—
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Butz, Thomas; Kaller, Ralf; Kissel, Guenther; Mayer, Gehard; Koch, Volker; and Schnabel, Werner, 6,039,779, Cl. 55-499.000.
Hummel, Karl Ernst; Luka, Helmut; and Sommer, Bruno, 6,039,780, Cl. 55-502.000.

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Jones, Robert Allen; Kaufman, Mark C.; and Rumpel, Manfred Carl, 6,039,351, Cl. 280-781.000.
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Hultholm, Stig-Erik; and Fugleberg, Sigmund Peder, 6,039,790, Cl. 75-739.000.

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Minami, Itsuji; and Takahashi, Kazuaki, 6,040,612, Cl. 257-432.000.
Ohno, Kazunori, 6,040,949, Cl. 359-689.000.
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Nakamura, Masaki; and Yoshida, Satoshi, 6,040,104, Cl. 430-110.000.
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Hotta, Nigishi; and Fujisawa, Hiroki, 6,040,326, Cl. 514-386.000.

Fujishima, Atuyoshi: *See*—
Yagi, Nobuaki; and Fujishima, Atuyoshi, 6,039,230, Cl. 227-120.000.

Fujita, Minoru: *See*—
Shibata, Shogo; Fujita, Minoru; Ikeda, Yuji; Ueda, Takaya; Itoh, Fumiaki; and Hirota, Makoto, 6,041,293, Cl. 704-4.000.

Fujitani, Ikuji: *See*—
Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, 6,041,082, Cl. 375-300.000.

Fujitsu Limited: *See*—
Fukumasa, Hidenobu; Oishi, Yasuyuki; Nagatani, Kazuo; and Hamada, Hajime, 6,041,034, Cl. 370-203.000.

Hasegawa, Shinya; Kayashima, Shigeo; Maeda, Satoshi; and Aritake, Hirokazu, 6,040,929, Cl. 359-17.000.

Kawabe, Keiko; Matsuo, Akihiko; Kimura, Minako; Nagahashi, Kenji; and Uehara, Sanya, 6,041,177, Cl. 395-704.000.

Kikuchi, Kazuhito, 6,041,414, Cl. 713-300.000.

Koike, Yoshio; Ohmuro, Katsufumi; Sasaki, Takahiro; and Takeda, Arihiro, 6,040,885, Cl. 349-129.000.

Komiya, Satoshi; Awaji, Naoki; and Kashiwagi, Shunji, 6,040,198, Cl. 438-16.000.

Kosaka, Tadayoshi; Toyoda, Osamu; and Namiki, Fumihiro, 6,039,622, Cl. 445-52.000.

Koshiba, Takeshi; Matsuoka, Masahiro; and Takayama, Kuniharu, 6,040,840, Cl. 345-441.000.

Kudo, Kenji; Kuwabara, Kohji; Yamashita, Shigeharu; Fuchigami, Kazutoshi; and Katsuyama, Norikazu, 6,040,987, Cl. 363-21.000.

Meki, Seiji; Yamada, Shunji; and Moriyama, Junichi, 6,041,066, Cl. 370-512.000.

Miyake, Shoji; Inaba, Toru; and Koda, Eiji, 6,041,052, Cl. 370-360.000.

Miyazaki, Akimitsu; Ibukuro, Sadao; and Nagakubo, Yasunori, 6,040,931, Cl. 359-110.000.

Mukai, Masanori, 6,039,246, Cl. 235-379.000.

Murakami, Hiroshi; Yoshioka, Koji; Morita, Keizo; Itokazu, Masafumi; Nakabayashi, Ken-ichi; Yamamoto, Akira; and Haraguchi, Munehiro, 6,040,814, Cl. 345-94.000.

Nishida, Masatsugu; Ikeda, Toru; and Yokoyama, Tomoki, 6,040,674, Cl. 318-632.000.

Otani, Seigen, 6,040,594, Cl. 257-295.000.

Shiitani, Shuichi; and Watanabe, Masaki, 6,040,836, Cl. 345-427.000.

Takashimizu, Yoshihiro; and Tabata, Yoshio, 6,040,923, Cl. 358-498.000.

Takimoto, Minoru, 6,041,350, Cl. 709-223.000.

Utsumi, Kenichi, 6,040,956, Cl. 360-92.000.

Yamamoto, Takayuki; Kasamatsu, Yoshiharu; Toyoguchi, Takashi; Yokohata, Toru; and Koishi, Ryosuke, 6,040,958, Cl. 360-103.000.

Yamato, Seiichi; Kamei, Noboru; Okuma, Kazuyoshi; Sugawa, Katsumi; Kadota, Hironori; and Sakata, Tomoyuki, 6,041,062, Cl. 370-465.000.

Zhang, Lei; Chou, William; Peters, Michael G.; and Beilin, Solomon I., 6,039,889, Cl. 216-17.000.

Fukada, Taisei; and Kohtani, Hideto, to Canon Kabushiki Kaisha. Display control method. 6,041,175, Cl. 395-500.420.

Fukada, Tetsuo: *See*—
Toyoda, Yoshihiko; Fukada, Tetsuo; Mori, Takeshi; and Hasegawa, Makiko, 6,039,808, Cl. 118-715.000.

Fukada, Toshiaki: *See*—
Schuster, Mike; and Fukada, Toshiaki, 6,041,299, Cl. 704-232.000.

Fukakusa, Shinji: *See*—
Gotou, Toyokazu; and Fukakusa, Shinji, 6,040,581, Cl. 250-390.010.

Fukami, Masanobu: *See*—
Tozu, Kenji; Itoh, Takayuki; Fukami, Masanobu; and Yokoyama, Satoshi, 6,039,411, Cl. 303-116.100.

Fukayama, Hiroyuki: *See*—
Sakurai, Yasuhiro; and Fukayama, Hiroyuki, 6,040,744, Cl. 331-176.000.

Fukuda, Kenichi; and Tarumi, Yasuo, to Shin-Etsu Chemical Co., Ltd. Addition-curable perfluoro compound-containing composition. 6,040,400, Cl. 526-126.000.

Fukui, Nobuhito: *See*—
Yako, Yuko; Takahashi, Kenji; Takagaki, Hiroshi; and Fukui, Nobuhito, 6,040,112, Cl. 430-270.100.

Fukui, Takayuki, to Nissan Motor Co., Ltd. Epoxy resin type composition for stiffening vehicle body and method for stiffening vehicle body. 6,040,350, Cl. 521-135.000.

Fukui, Wataru: *See*—
Takahashi, Yasuhiro; and Fukui, Wataru, 6,040,698, Cl. 324-399.000.

Fukumasa, Hidenobu; Oishi, Yasuyuki; Nagatani, Kazuo; and Hamada, Hajime, to Fujitsu Limited. Spread spectrum communication system. 6,041,034, Cl. 370-203.000.

Fukumuro, Kaori: *See*—
Mano, Shigeru; Watanabe, Hiroshi; Fukumuro, Kaori; and Yamaya, Yorihiro, 6,040,267, Cl. 503-201.000.

Fukuno, Hiroki: *See*—
Suenaga, Kiyoshi; Tomita, Yasuoki; and Fukuno, Hiroki, 6,039,531, Cl. 415-115.000.

Fukuo, Hidetoshi; and Yokoi, Masakazu, to Sakura Color Products Corporation. Ink composition for oil marking pen. 6,039,795, Cl. 106-31.580.

Fukuoka, Mutsuo, to Brother Kogyo Kabushiki Kaisha. Ink jet recording apparatus with recovering device of ink jet head. 6,039,432, Cl. 347-32.000.

Fukushima, Eiji; and Shimizu, Shigemi, to Sanden Corporation. Reciprocating pistons of piston-type compressor. 6,038,960, Cl. 92-12.200.

Fukushima, Hirotaka; and Takenaka, Mitsuhiko, to Exedy Corporation. Flex plate and flywheel configuration. 6,039,651, Cl. 464-98.000.

Fukushima, Shinichi: *See*—
Izumi, Nobuaki; Fukushima, Shinichi; and Tsukamoto, Junichi, 6,040,873, Cl. 348-559.000.

Fukuta, Kinsho: *See*—
Hirabayashi, Mineo; Hozumi, Mamoru; and Fukuta, Kinsho, 6,039,465, Cl. 362-496.000.

Fukuyama, Yoshitaka: *See*—
Ohtomo, Fumio; Nakata, Yuji; Fukuyama, Yoshitaka; Inomata, Asako; Shibuya, Sachio; Koga, Akinori; Ishii, Junji; Ito, Shoko; and Yamamoto, Hironobu, 6,038,850, Cl. 60-39.182.

Fulford, H. James; and Gardner, Mark I., to Advanced Micro Devices, Inc. Formation of lightly doped regions under a gate. 6,040,602, Cl. 257-344.000.

Fulford, H. Jim: *See*—
Wristers, Derick J.; Fulford, H. Jim; and Gardner, Mark I., 6,040,607, Cl. 257-389.000.

Fullen, George R.: *See*—
Fullen, Jeryl G.; and Fullen, George R., 6,038,935, Cl. 73-865.400.

Fullen, Jeryl G.; and Fullen, George R., to Fullen Systems, Inc. Apparatus and method for measuring the magnitude and distribution of forces on the foot of a quadruped. 6,038,935, Cl. 73-865.400.

Fullen Systems, Inc.: *See*—
Fullen, Jeryl G.; and Fullen, George R., 6,038,935, Cl. 73-865.400.

Fullerton, Michael G.: *See*—
Mehney, Mark A.; McCarthy, Michael C.; Fullerton, Michael G.; and Malecke, Floyd J., 6,039,344, Cl. 280-735.000.

Fulterer Gesellschaft m.b.H.: *See*—
Fulterer, Manfred, 6,039,421, Cl. 312-333.000.
Fulterer, Manfred, 6,039,423, Cl. 312-334.290.

Fulterer, Manfred, to Fulterer Gesellschaft m.b.H. Pull-out device. 6,039,421, Cl. 312-333.000.

Fulterer, Manfred, to Fulterer Gesellschaft m.b.H. Pull-out device for a tall cupboard. 6,039,423, Cl. 312-334.290.

Funada, Masahiro; and Toda, Yukari, to Canon Kabushiki Kaisha. Image processing apparatus for laying out plurality of images in conformity with image orientation. 6,041,205, Cl. 399-196.000.

Funayama, Yasuhiro: *See*—
Hori, Takeshi; Uezono, Tsutomu; Yoshii, Tomoyuki; and Funayama, Yasuhiro, 6,040,106, Cl. 430-127.000.

Furukawa, Hiroyuki, to Sharp Kabushiki Kaisha. Driving circuit for driving simple matrix type display apparatus. 6,040,826, Cl. 345-196.000.

Furukawa, Taichiro; Kondoh, Kohhei; Yamashita, Atsushi; and Kanbori, Seiji, to NTN Corporation. Retainer for roller bearing and method for manufacturing the same. 6,039,475, Cl. 384-580.000.

Furuya, Yoshiyuki: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

Fushimi, Koichi: *See*—
Okuda, Akihito; Fushimi, Koichi; and Terayama, Hiroshi, 6,039,666, Cl. 475-72.000.

Futaba Denshi Kogyo K.K.: *See*—
Itoh, Shigeo; Makita, Yoshio; Tonegawa, Takeshi; Hirata, Yoshihiko; and Kadowaki, Akira, 6,039,620, Cl. 445-25.000.

Future Tek, Inc.: *See*—
Gehrke, Larry M; Gehrke, Russel J.; Gehrke, Michael S.; and Gehrke, Gabriel P., 6,039,914, Cl. 264-460.000.

Gabas, Carlos; and Casas, Jordi, to Fico Cables, S.A. Manually adjusted device for control cable terminals. 6,038,942, Cl. 74-500.500.

Gabe, Howard L., to Novartis AG. Soybean cultivar B630518RR. 6,040,501, Cl. 800-312.000.

Gabig, Joseph A.; and Jones, David B., to Matthews International Corporation. Merchandising selling system and display unit. 6,039,576, Cl. 434-367.000.

Gabriel, Robert: *See*—
Popoff, Christine; Nartey, Alwyn; Gabriel, Robert; and Aubay, Eric, 6,040,288, Cl. 510-466.000.

Gadre, Shirish: *See*—
Ozcelik, Taner; Gadre, Shirish; and Tan, Yew-Koon, 6,041,400, Cl. 712-35.000.

Gaertner, Mark A.; and Heath, Mark A., to Seagate Technology, Inc. System and method for formatting disc surfaces. 6,040,952, Cl. 360-48.000.

Gagliardo, John P., to Regal Products, Inc. Fluid proportioning valve and method. 6,039,065, Cl. 137-3.000.

Gaglione, Philippe: *See—*
Martin, Varenka; Archambaud, Denis; Feyfant, Patrick; Gaglione, Philippe; Yoshida, Satoshi; Winckel, Laurent; and Weigelt, Oliver, 6,041,217, Cl. 455-38.300.

Gale, Gregory W. Flexible protective article and packaging using same. 6,039,184, Cl. 206-586.000.

Gallatin, W. Michael; and Vazeux, Rosemay, to ICOS Corporation. Antibodies to ICAM-related protein. 6,040,176, Cl. 435-326.000.

Gallimore, Michael B.; and Gibson, Donald, to Serrmi Products, Inc. Adjustable pier railroad house assembly having dual adjustment capabilities. 6,038,823, Cl. 52-126.100.

Gallopac Industries Inc.: *See—*
Flowers, Brian Lee, 6,039,210, Cl. 222-1.000.

Galperin, Anatoly: *See—*
Miller, Bearge; Miller, Norman K.; Sarkisian, Gevork; Sarkissian, Karen; and Galperin, Anatoly, 6,040,536, Cl. 200-83.00N.

Galyon, Michael E.: *See—*
Cheng, Luo; Irick, Glenn E., Sr.; Chu, Youe-Tsyr; Ghorashi, Hossein M.; Galyon, Michael E.; and Overbay, Mark A., 6,040,905, Cl. 356-238.300.

Gambro AB: *See—*
Wieslander, Anders; and Cappelli, Giorgio, 6,039,719, Cl. 604-410.000.
Wieslander, Anders, 6,039,720, Cl. 604-410.000.

Gamou, Naoyasu, to Sony Corporation. Color signal adjustment apparatus. 6,040,855, Cl. 348-223.000.

Gan, Joseph; Badini, Gabriele; and Hoffmann, Klaus E., to Dow Chemical Company, The. Curing catalysts for curing epoxy resins. 6,040,396, Cl. 525-502.000.

Gandhi, Deepak R.: *See—*
Quiachon, Dignah B.; Gandhi, Deepak R.; Brooks, Dennis L.; Imran, Mir A.; and Guidi, Roger J., 6,039,743, Cl. 606-108.000.

Gandre, Jerry D.; Sands, Steven L.; Mills, R. Steven; and Lopez, Arthur, to Dell USA, L.P. Electronic system implementing redundant and nonredundant power supply configurations. 6,040,982, Cl. 361-724.000.

Ganem, Charles F.: *See—*
Cote, Andrew L., Sr.; and Ganem, Charles F., 6,039,302, Cl. 251-149.100.

Gangkofner, Stefan: *See—*
Steiner, Klaus; Gangkofner, Stefan; and Grunenwald, Jean-Marie, 6,040,479, Cl. 564-304.000.

Gangly, Ashit: *See—*
Greenlee, William; Gangly, Ashit; and Wasley, Jan W. F., 6,040,448, Cl. 544-363.000.

Gankema, Harold: *See—*
Kok, Douwe Marten; and Gankema, Harold, 6,040,278, Cl. 508-208.000.

Gannon, John J., Jr.: *See—*
Gontarski, Christopher J.; Ogden, Steven D.; and Gannon, John J., Jr., 6,039,106, Cl. 160-201.000.

Gansemans, Yannick Georges Jozef: *See—*
Vlasuk, George Phillip; Stanssens, Patrick Eric Hugo; Messens, Joris Hilda Lieven; Lauwereys, Marc Josef; LaRoche, Yves Rene; Jespers, Laurent Stephane; Gansemans, Yannick Georges Jozef; Moyle, Matthew; and Bergum, Peter W., 6,040,441, Cl. 536-252.000.

Gao, Yuan: *See—*
Manev, Vesselin; Faulkner, Titus; Barnette, Wayne; and Gao, Yuan, 6,040,089, Cl. 429-231.100.

Gao, Yun; Hett, Robert; Fang, Kevin Q.; Wald, Stephen A.; Redmon, Martin P.; and Senanayake, Chris Hugh, to Sepracor Inc. Formoterol process. 6,040,344, Cl. 514-554.000.

Garcia, Douglas J.; and Saulnier, Christian, to Electro Scientific Industries, Inc. Rolling electrical contactor. 6,040,705, Cl. 324-762.000.

Garczarek, Michel: *See—*
Mangano, Alain; Allart, Bernard; Bigo, Louis; Garczarek, Michel; Ethet, Yannick; Crave, Joël; and Peignon, Philippe, 6,038,859, Cl. 60-436.000.

Gardiner, Ian: *See—*
Kennelly, Kevin; Gardiner, Ian; Noble, David; and Muliadiredja, Achmad R., 6,039,507, Cl. 405-227.000.

Gardner, Mark I.; and Gilmer, Mark C., to Advanced Micro Devices, Inc. Oxide formation technique using thin film silicon deposition. 6,040,207, Cl. 438-216.000.

Gardner, Mark I.; Kadosh, Daniel; and Duane, Michael P., to Advanced Micro Devices, Inc. Asymmetrical transistor formed from a gate conductor of unequal thickness. 6,040,220, Cl. 438-286.000.

Gardner, Mark I.: *See—*
Fulford, H. James; and Gardner, Mark I., 6,040,602, Cl. 257-344.000.
Wristers, Derick J.; Fulford, H. Jim; and Gardner, Mark I., 6,040,607, Cl. 257-389.000.

Garfield, Robert E.: *See—*
Chwalisz, Krzysztof; and Garfield, Robert E., 6,040,340, Cl. 514-509.000.

Garlock Inc: *See—*
Harrelson, Albert L., III, 6,038,778, Cl. 33-483.000.

Garner, Frank; and Klamecki, Joseph, to Aeroquip Vickers, Inc. Aeration-cavitation demonstration console. 6,039,570, Cl. 434-126.000.

Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., to Genentech, Inc. Enrichment method for variant proteins with altered binding properties. 6,040,136, Cl. 435-5.000.

Gasparrini, C. Robert: *See—*
Hara, Akira; Onuma, Hiraku; Oyaizu, Hideo; Suzuki, Yuuichi; and Gasparrini, C. Robert, 6,038,731, Cl. 15-256.510.

Gateway 2000, Inc.: *See—*
Spencer, Julian A. Q., 6,040,978, Cl. 361-683.000.

Gau, Jing-Horng, to United Semiconductor Corp. Method of manufacturing shallow trench isolation. 6,040,232, Cl. 438-424.000.

Gau, Tsai-Sheng; and Dai, Chang-Ming, to Industrial Technology Research Institute. Elimination of proximity effect in photoresist. 6,040,119, Cl. 430-330.000.

Gdula, Michael: *See—*
Wojnarowski, Robert John; Rose, James Wilson; Balch, Ernest Wayne; Douglas, Leonard Richard; Downey, Evan Taylor; and Gdula, Michael, 6,040,226, Cl. 438-381.000.

Gebauer, Günter: *See—*
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Gebler, Charlene Ann: *See—*
Boroczky, Lilla; Gebler, Charlene Ann; Kaczmarczyk, John M.; Westermann, Edward F.; and Woodard, Robert L., 6,040,861, Cl. 348-409.000.

GEBO Conveyors Consultants & Systems, Inc.: *See—*
Ross, Yvan, 6,040,553, Cl. 219-121.710.

GEC Alsthom Transport SA: *See—*
Laporte, Jean-Jacques; Tassily, Eric; and Muttin, Frédéric, 6,039,349, Cl. 280-748.000.

Gehre, Hans-Joachim; and Winterstein, Frank, to Siemens Aktiengesellschaft. Direct voltage back-up system at a power supply outlet. 6,040,640, Cl. 307-66.000.

Gehrke, Gabriel P.: *See—*
Gehrke, Larry M; Gehrke, Russel J.; Gehrke, Michael S.; and Gehrke, Gabriel P., 6,039,914, Cl. 264-460.000.

Gehrke, Larry M; Gehrke, Russel J.; Gehrke, Michael S.; and Gehrke, Gabriel P., to Future Tek, Inc. Method of converting asphalt composition roofing shingles into dimensional construction products. 6,039,914, Cl. 264-460.000.

Gehrke, Michael S.: *See—*
Gehrke, Larry M; Gehrke, Russel J.; Gehrke, Michael S.; and Gehrke, Gabriel P., 6,039,914, Cl. 264-460.000.

Gehrke, Russel J.: *See—*
Gehrke, Larry M; Gehrke, Russel J.; Gehrke, Michael S.; and Gehrke, Gabriel P., 6,039,914, Cl. 264-460.000.

Geib, Joseph J.; Casanova, Scott D.; Mennie, Douglas U.; Mazur, Richard A.; and Watts, Gary P., to Cummins-Allison Corp. Coin sorter. 6,039,644, Cl. 453-10.000.

Geis, David G.; Doikas, Peter; and Demonaco, Jeffrey, to Motorola, Inc. Discharge lamp ballast housing with solderless connectors. 6,039,582, Cl. 439-76.100.

Gelfand, David H.: *See—*
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; Mullis, Kary B.; and Gelfand, David H., 6,040,166, Cl. 435-194.000.

GEN Maintenance Technology Inc.: *See—*
Tominaga, Youji; Toda, Kazuo; and Yamamura, Nobuo, 6,040,049, Cl. 428-355.0EN.

Genda, Kyoji: *See—*
Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 6,041,191, Cl. 396-311.000.

Gendrot, Edouard; Cousin, Gérard; Ragot, Françoise; and Clee-Bouvet, Marie-Christine, to Laboratoires Prographarm. Multiparticulate pharmaceutical form with programmed and pulsed release and process for its preparation. 6,039,979, Cl. 424-497.000.

Gene Shears Pty. Limited: *See—*
Sioud, Mouldy, 6,040,159, Cl. 435-91.310.

Genemedicine, Inc.: *See—*
Rolland, Alain; and Mumper, Russell J., 6,040,295, Cl. 514-44.000.

Genentech, Inc.: *See—*
Garrard, Lisa J.; Henner, Dennis J.; Bass, Steven; Greene, Ronald; Lowman, Henry B.; Wells, James A.; and Matthews, David J., 6,040,136, Cl. 435-5.000.
Lasky, Laurence A.; and Dowbenko, Donald J., 6,040,437, Cl. 536-23.100.

General DataComm, Inc.: *See—*
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General Dynamics Armament Systems, Inc.: *See—*
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General Electric Company: *See—*
Burkus, Frank S., II; Jeram, Edward M.; and Rubinsztajn, Slawomir, 6,040,366, Cl. 524-99.000.
Chbat, Nicolas Wadih; and Badami, Vivek Venugopal, 6,038,724, Cl. 8-159.000.
Einziger, William Louis; Eckels, Phillip William; and Creel, Michael Loren, 6,038,867, Cl. 62-45.100.
Isaacs, Ralph G.; and Portaz, Joseph M., 6,041,132, Cl. 382-100.000.
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Paul, William C.; and Sieloff, Gloria, 6,040,250, Cl. 442-61.000.
Schilling, Jan C.; Cornell, Jay L.; and Stevenson, Joseph T., 6,039,542, Cl. 416-233.000.
Wojnarowski, Robert John; Rose, James Wilson; Balch, Ernest Wayne; Douglas, Leonard Richard; Downey, Evan Taylor; and Gdula, Michael, 6,040,226, Cl. 438-381.000.

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Young, Henry Todd; Beach, Frederick Gaylord; and Roman, James Price, 6,041,285, Cl. 702-113.000.
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General Instrument Corporation: *See*—
Rao, R. Padmanabha; and Chin, Amanda L., 6,041,142, Cl. 382-232.000.
General Motors Corporation: *See*—
Breidenbach, Paul, 6,039,019, Cl. 123-90.610.
Chandy, Ashok; Pattok, Kathryn Lynn; and Chhaya, Deepak, 6,039,144, Cl. 180-446.000.
Doxey, Mark Harvey; and Young, Shirley M., 6,039,341, Cl. 280-728.200.
Field, Martin John; Ballmert, Bernd Jakob; Collins, Laurence Alexander; and Moran, Robert James, 6,039,034, Cl. 123-568.230.
Gutierrez, Ernesto Jose; Archibald, Charles Andrew; Kachur, Christopher M.; and Brandon, Giles M., 6,038,871, Cl. 62-133.000.
Haag, Ronald Helmut; Orr, Brian Norman; and Moceanu, John Ion, 6,038,818, Cl. 49-360.000.
Hendriksma, Nick John, 6,039,017, Cl. 123-90.430.
Joppeck, Dwayne Paul, 6,039,160, Cl. 192-52.500.
Kielar, Stanley John; Westercamp, Kenneth Lee; and Bauer, Chad David, 6,039,143, Cl. 180-412.000.
Krajewski, Paul Edward; Lanzi, Ronald George; and Schroth, James Gregory, 6,038,911, Cl. 72-379.200.
Murty, Balarama Vempaty, 6,040,561, Cl. 219-494.000.
Niederman, Robert Raymond; Starner, Allen Richard; and Ryan, Shawn Gregory, 6,039,348, Cl. 280-741.000.
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Spath, Mark James, 6,039,018, Cl. 123-90.550.
General Scientific Corporation: *See*—
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Gentry, Daniel Robert; Greenwood, Rebecca Claire; and Lawlor, Elizabeth Jane, to Smithkline Beecham Corporation. Histidyl tRNA synthetase from *Streptococcus pneumoniae*. 6,040,162, Cl. 435-183.000.
Georgetown University: *See*—
Lippman, Marc E.; and Lupu, Ruth, 6,040,290, Cl. 514-12.000.
Gerena, Linda: *See*—
Davies, Ian W.; Journet, Michel; Gerena, Linda; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, 6,040,450, Cl. 546-256.000.
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Califano, Andrea; Colville, Scott Eric; and Germain, Robert Steven, 6,041,133, Cl. 382-124.000.
Gerold, Gregory L.; and Wiesenhahn, Mark R. Voice-activated toy truck with animated features. 6,039,626, Cl. 446-175.000.
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Cutler, Stanley; Gerth, Gayle B.; Otis, Alton B., Jr.; and Chau, Taylor, 6,039,702, Cl. 601-15.000.
Gertner, Kevin: *See*—
Javier, Manuel A., Jr.; Pearce, Stephen B.; Kesten, Randy J.; Payne, Sam G.; and Gertner, Kevin, 6,039,727, Cl. 606-10.000.
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Park, Edward H.; and Sweeney, Philip, 6,039,054, Cl. 132-321.000.
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Gardner, Mark I.; and Gilmer, Mark C., 6,040,207, Cl. 438-216.000.
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Yamamoto, Akira, 6,041,421, Cl. 714-7.000.
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McKinlay, Alistair N., 6,039,524, Cl. 411-149.000.

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Riedel, Michael; Weller, Thomas; Jacobs, Alexandra; Herrmann, Wolfgang Anton; and Morawietz, Markus, 6,040,469, Cl. 556-53.000.

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Zhou, Guo-Fu; Jacobs, Bernardus A.J.; Rijpers, Johannes C.N.; and Borg, Hermanus J., 6,040,066, Cl. 428-641.000.

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Beijaard, Barend Jacobus Emmanuel; Jacobs, Thomas Gerardus Maria; and Tiggeloven, Leonardus Jozephus Antonius, 6,039,080, Cl. 138-115.000.

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Zimmerman, Julie G.; and Jacobsen, Alex W., 6,039,495, Cl. 402-79.000.

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Münch, Ulrich; Jaeggi, Dominik; and Schneeberger, Niklaus, 6,040,579, Cl. 250-344.000.

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Boettcher, John W.; Jagannathan, Seshadri; Orem, Michael W.; and Zola, Philip J., 6,040,128, Cl. 430-569.000.

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Fishback, Thomas L.; Heyman, Duane A.; Reichel, Curtis J.; and Jaglowski, Adam J., 6,040,413, Cl. 528-44.000.

Jaguar Cars, Limited, Whitley, Coventry: *See*—
Howell, Steven Christopher, 6,040,638, Cl. 307-10.200.

Jahn, Hans-Peter: *See*—
Herden, Werner; Konrad, Johann; Jahn, Hans-Peter; Knapp, Martin; Fuessl, Hans-Peter; and Qu, Ning, 6,040,204, Cl. 438-109.000.

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Bigham, John A.; Little, Dave; Mihm, Edward C.; Sistanizadeh, Kamran; Amin-Salehi, Bahman; Jain, Alpna; Lightfoot, Regina; and Arthur, Ulric E., 6,041,056, Cl. 370-395.000.

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Carman, David; Dalal, Siddhartha R.; Jain, Ashish; and Karunanithi, Nachimuthu, 6,041,330, Cl. 707-101.000.

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Jano, Patrice: *See*—
Rioland, Jacques; Thibout, Paul; and Jano, Patrice, 6,040,566, Cl. 250-201.900.

Jansen, Rolf-Michael: *See*—
Behme, Klaus-Jürgen; Jansen, Rolf-Michael; and Zimmermann, Andreas, 6,040,375, Cl. 524-492.000.

Janzen, Erik: *See*—
Ellison, Alex; Kordina, Olle; Gu, Chun-Yuan; Hallin, Christer; Janzen, Erik; and Tuominen, Marko, 6,039,812, Cl. 118-725.000.

Janzen, Jeffrey W.: *See*—
Baudouin, Daniel; Russell, Ernest J.; and Janzen, Jeffrey W., 6,040,983, Cl. 361-760.000.

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Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.

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Sobajima, Yoshihiro; Akashige, Etsushi; Fujii, Hironari; and Amano, Akira, 6,040,374, Cl. 524-451.000.

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Monoi, Takashi; Yamamoto, Masakazu; Torigoe, Hidenobu; and Takemoto, Yasunori, 6,040,399, Cl. 526-106.000.

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Hayakawa, Yoshihiro; and Kataoka, Masanori, 6,040,439, Cl. 536-25.340.

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Yoshida, Hiroaki; Hagiwara, Zenzo; and Terasaki, Masanao, 6,040,086, Cl. 429-211.000.

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Jaw, Jerry, to United Microelectronics Corp. High-speed analog-to-digital converter. 6,040,794, Cl. 341-155.000.

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Cutler, Stanley; Gerth, Gayle B.; Otis, Alton B., Jr.; and Chau, Taylor, 6,039,702, Cl. 601-15.000.

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Blakeney, Andrew J.; Medina, Arturo N.; Toukhy, Medhat A.; Ferreira, Lawrence; Jeffries, Alfred T., III; and Naiini, Ahmad A., 6,040,107, Cl. 430-165.000.

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Jen, Zo-Chun, to Nan Ya Plastics Corporation. Process for manufacturing different shrinkage microfiber texture yarn. 6,038,847, Cl. 57-908.000.

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Prasad, Arun; Karmaker, Ajit; Zammarieh, Elie; and Day, Grant P., 6,039,569, Cl. 433-180.000.

Jenkines, Randall C.: *See*—
Jennings, James K.; Jenkines, Randall C.; and Mobley, Larry W., 6,040,381, Cl. 524-871.000.

Jenkins, David: *See*—
Cigaina, Valerio; and Jenkins, David, 6,041,258, Cl. 607-40.000.

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Jensen, Allan G.: *See*—
Martin, Wallace Anthony; Adams, Jonathan Patrick; Andersen, Finn Thrige; Beaton, Stephen Robert; Christensen, Svend; Jensen, Allan G.; Kindt-Larsen, Ture; Lust, Victor; Walker, Craig William; and Wang, Daniel Tsu-Fang, 6,039,899, Cl. 264-1.360.

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Greener, Alan L.; and Jerpseth, Bruce D., 6,040,184, Cl. 435-461.000.

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Vlasuk, George Phillip; Stanssens, Patrick Eric Hugo; Messens, Joris Hilda Lieven; Lauwereys, Marc Josef; LaRoche, Yves Rene; Jespers, Laurent Stephane; Gansemans, Yannick Georges Jozef; Moyle, Matthew; and Bergum, Peter W., 6,040,441, Cl. 536-252.000.

Jessup, James Lyle; and Paalman, Donald Henry, to Kimberly-Clark Worldwide, Inc. Laterally expandable tampon. 6,039,716, Cl. 604-385.100.

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Gutman, George; Jiang, Licai; and Verman, Boris, 6,041,099, Cl. 378-85.000.

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Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.

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Nishida, Takanobu; and Jikuhara, Ichiro, 6,040,789, Cl. 341-50.000.

Jin, Sang-Hun, to Daewoo Electronics Co., Ltd. Method for transforming original bill-of-material for printed circuit board into standard bill-of-material. 6,041,268, Cl. 700-107.000.

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Jinks, Philip A.: *See*—
Govind, Nayna; Jinks, Philip A.; Ross, Danna L.; and Ward, Gary H., 6,039,932, Cl. 424-45.000.

Jo, Sung Hwan, to Hyundai Motor Company, Ltd. Piston ring device for use in a combustion engine of a vehicle. 6,039,321, Cl. 277-435.000.

Jobson, Simon; and Watson, Derrick John, to BP Chemicals Limited. Integrated process for the production of vinyl acetate and/or acetic acid. 6,040,474, Cl. 560-243.000.

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Joersz, Robert T.: *See*—
Gilbert, Bruce Michael; Joersz, Robert T.; Lovett, Thomas D.; and Safranek, Robert J., 6,041,376, Cl. 710-108.000.

Joffe, Alexander; and Birger, Ari, to MMC Networks, Inc. Time-wheel ATM cell scheduling. 6,041,059, Cl. 370-412.000.

Johansson, Marie: *See*—
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Johns Hopkins University: *See*—
Pasternack, Gary R., 6,040,173, Cl. 435-320.100.

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Martin, Wallace Anthony; Adams, Jonathan Patrick; Andersen, Finn Thrige; Beaton, Stephen Robert; Christensen, Svend; Jensen, Allan G.; Kindt-Larsen, Ture; Lust, Victor; Walker, Craig William; and Wang, Daniel Tsu-Fang, 6,039,899, Cl. 264-1.360.
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Holder, John D.; and Johnson, Bayard K., 6,039,801, Cl. 117-20.000.

Johnson, Daniel: *See*—
Gillis, Donald G.; and Johnson, Daniel, 6,039,147, Cl. 182-15.000.

Johnson, David C: *See*—
Dunphy, Katherine Ann; Schnapp, Susan T; and Johnson, David C, 6,039,443, Cl. 347-92.000.

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Johnson, Greg P., to Micron Electronics, Inc. Disk drive to chassis mounting apparatus and method. 6,040,980, Cl. 361-685.000.

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Johnson, James R. Fastener tape material, bag utilizing fastener tape material, and method of manufacture thereof. 6,040,033, Cl. 428-99.000.

Johnson, Karl M.: *See*—
Adair, Dennis W.; Johnson, Karl M.; and Kern, Earl R., 6,040,298, Cl. 514-50.000.

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Johnson, Kristina M.; and Mao, Chong Chang, to University Technology Corporation. Programmable hologram generator. 6,040,883, Cl. 349-116.000.

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Goertz, Harvey M.; Timmons, Richard J.; and Johnson, William R., 6,039,781, Cl. 71-1.000.

Johnson Worldwide Associates, Inc.: *See*—
Graber, John H.; and Pomerantz, Mitchell P., 6,039,043, Cl. 128-202.140.

Johnston, Stephen Harold: *See*—
Collier, Alan Derek; Johnston, Stephen Harold; and Eastham, John, 6,039,239, Cl. 228-157.000.

Jonckheere, Marcus: *See*—
Coppens, Paul; and Jonckheere, Marcus, 6,040,109, Cl. 430-204.000.

Jones, Billy Dan, to Field Management Services, Inc. Apparatus, methods and material for absorbing magnetic radiation. 6,040,878, Cl. 348-819.000.

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Gabig, Joseph A.; and Jones, David B., 6,039,576, Cl. 434-367.000.

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Watson, Charles C.; and Jones, William F., 6,040,580, Cl. 250-363.030.

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Jordan Valley Applied Radiation: *See*—
Yokhin, Boris, 6,041,095, Cl. 378-45.000.

Jordi, Hans Ulrich, to Neopac AG. Screw cap. 6,039,199, Cl. 215-254.000.

Jörg Vogelsang GmbH & Co.: *See*—
Vogelsang, Jörg, 6,038,943, Cl. 74-579.00E.

Jø rgensen, Tine Krogh: *See*—
Andersen, Knud Erik; Jørgensen, Tine Krogh; Hohlweg, Rolf; Fischer, Erik; Olsen, Uffe Bang; Polivka, Zdenek; Sindelar, Karel; and Valenta, Vladimir, 6,040,318, Cl. 514-329.000.

Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.

Jost, Michael: *See*—
Wandel, Hermann; Jost, Michael; Sommer, Helmut; and Fischer-Wilk, Robert, 6,038,932, Cl. 73-861.650.

Journet, Michel: *See*—
Davies, Ian W.; Journet, Michel; Gerena, Linda; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, 6,040,450, Cl. 546-256.000.

Joyce, Mary: *See*—
Kennie, Jerry; Cheng, Yi; Hope, Mark E.; Huff, Shean; Nankee, Robert J., II; Joyce, Mary; Krozek, Dennis A.; Moote, Richard K.; Richardson, Roland T.; Rotramel, William D.; and Seitz, Gary L., 6,041,278, Cl. 701-103.000.

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Chan, Chong Veng, 6,039,662, Cl. 473-604.000.

JSR Corporation: *See*—
Ota, Toshiyuki; Sano, Kimiyasu; Tashiro, Hideaki; and Sato, Hozumi, 6,040,117, Cl. 430-311.000.

Ju, Dz Ching; Ng, John Shek-Luen; and Sarkar, Vivek, to International Business Machines Corporation. Method of, system for, and computer program product for providing quick fusion in WHERE constructs. 6,041,181, Cl. 395-709.000.

Ju, Ted. Compact disk box capable of automatically extending and retracting compact disks. 6,039,413, Cl. 312-9.150.

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Huynh, Quoi V.; Ngo, Sang T.; Judkins, Joseph James, III; and Alfano, Donald E., 6,040,668, Cl. 318-471.000.

Julian, Thomas Benjamin: *See*—
Rabin, Yoed; Julian, Thomas Benjamin; and Wolmark, Norman, 6,039,730, Cl. 606-23.000.

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Jun, Sun Ae: *See*—
Ha, Jae Hee; and Jun, Sun Ae, 6,039,888, Cl. 216-13.000.

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Jung, In Chul: *See*—
Kim, Jung Pill; and Jung, In Chul, 6,041,009, Cl. 365-225.700.

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Siegel, Jörg; Borst, Hans-Ulrich; Bell, Peter; Büscher, Ralf; Reif, Heinz; and Jung, Jürgen, 6,040,125, Cl. 430-506.000.

Jung, Matthias: *See*—
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Haga, Ryo, 6,041,004, Cl. 365-207.000.
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Kohno, Fumihiro, 6,041,013, Cl. 365-230.030.
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Gutierrez, Ernesto Jose; Archibald, Charles Andrew; Kachur, Christopher M.; and Brandon, Giles M., 6,038,871, Cl. 62-133.000.

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Chen, Tian-Chu, 6,039,394, Cl. 297-195.100.

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Kanome, Yuji, to Canon Kabushiki Kaisha. Recording apparatus having deviation adjusting mechanism. 6,039,427, Cl. 347-19.000.

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Sasaki, Tsuneo, 6,039,342, Cl. 280-728.300.

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Davidovici, Sorin; Tran, Jimmy Cuong; and Kanterakis, Emmanuel, 6,041,073, Cl. 375-148.000.

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McCarthy, Dennis Ronald; Fossaceca, John Mark; and Kapadia, Maneck Behram, 6,041,240, Cl. 455-464.000.

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Sanders, Marcus Maria; Kapitan, John Mark; and Brown, Henry John Harding, 6,039,738, Cl. 606-61.000.

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Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.

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Hancock, Robert E. W.; and Karunaratne, Nedra, 6,040,435, Cl. 536-23.100.

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Cardona, Edgardo, 6,039,522, Cl. 410-127.000.

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Krumm, Helmut; Kittel, Florenz; Koette, Rolf; and Motzheim, Ralf, 6,039,907, Cl. 264-161.000.

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Kakizaki, Yukio; Kiuchi, Toru; Amano, Kesayoshi; and Umatate, Toshikazu, 6,040,096, Cl. 430-5.000.

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Bangs, William E.; Khoo, Chor San Heng; and Ko, Sandy, 6,039,978, Cl. 424-489.000.
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Yamada, Chuji; Kobayashi, Shin; Ogawa, Makoto; Kuwahara, Tohru; and Okumura, Eiji, 6 039,157, Cl. 188-158.000.

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Wiacek, Michael F.; and Koch, Gary L., 6,039,407, Cl. 301-111.000.

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Posselt, Andreas; and Koehler, Christian, 6,039,021, Cl. 123-306.000.

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Krumm, Helmut; Kittel, Florenz; Koette, Rolf; and Motzheim, Ralf, 6,039,907, Cl. 264-161.000.

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Yamamoto, Takayuki; Kasamatsu, Yoshiharu; Toyoguchi, Takashi; Yokohata, Toru; and Koishi, Ryosuke, 6,040,958, Cl. 360-103.000.

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Noguchi, Hiromichi; Sugitani, Hiroshi; Koizumi, Yutaka; Inamoto, Tadayoshi; Aono, Kiyomi; and Nakata, Yoshie, 6,040,002, Cl. 427-96.000.

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Yamamoto, Hiroshi; Shimeki, Yasuharu; Kayashima, Kazuhiro; Maruno, Susumu; Fujimoto, Makoto; and Kojima, Yoshihiro, 6,040,825, Cl. 345-173.000.
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Kazo, Osamu; and Kokubo, Tsuyoshi, 6,039,412, Cl. 311-39.100.

Kokuga, Toshiharu: *See*—
Toya, Shoichi; and Kokuga, Toshiharu, 6,040,680, Cl. 320-108.000.

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Kolb, Charles E.: *See*—
Jayne, John T.; Worsnop, Douglas R.; and Kolb, Charles E., 6,040,574, Cl. 250-288.000.

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Weiner, Michael L.; Kolb V, John Jacob; and Chronis, Todd, 6,041,331, Cl. 707-103.000.

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Ikeda, Kazuo; Komorita, Hiroshi; Sato, Yoshitoshi; Komatsu, Michiyasu; and Mizunoya, Nobuyuki, 6,040,039, Cl. 428-210.000.

Komatsubara, Michiro: *See*—
Toge, Tetsuo; Komatsubara, Michiro; Honda, Atsuhito; Sadahiro, Kenichi; and Senda, Kunihiro, 6,039,818, Cl. 148-307.000.

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Bach, Guenther; and Naumann, Heinz, 6,039,634, Cl. 451-49.000.

Komiya, Satoshi; Awaji, Naoki; and Kashiwagi, Shunji, to Fujitsu Limited. Element concentration measuring method and apparatus, and semiconductor device fabrication method and apparatus. 6,040,198, Cl. 438-16.000.

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Osawa, Seiichi; and Komiyama, Takeo, 6,039,440, Cl. 347-70.000.

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Ota, Masuyuki; Kawachi, Genshiro; Kitajima, Masaaki; Sasaki, Tohru; Oh-e, Masahito; Kondo, Katsumi; and Tsumura, Makoto, 6,040,886, Cl. 349-141.000.

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Kondo, Shiro: *See*—
Mizuno, Yuhei; Kawamura, Yoshihiro; and Kondo, Shiro, 6,039,766, Cl. 8-142.000.

Kondoh, Kohhei: *See*—
Furukawa, Taichiro; Kondoh, Kohhei; Yamashita, Atsushi; and Kanbori, Seiji, 6,039,475, Cl. 384-580.000.

Kondoh, Takeshi: *See*—
Kato, Kiichiro; Kondoh, Takeshi; Taguchi, Katsuhisa; and Takahashi, Kazuhiro, 6,040,048, Cl. 428-345.000.

Kondranin, Sergey Gennadievich: *See*—
Antonova, Tatijana Borisovna; Bougrov, Gleb Elmirovich; Kondranin, Sergey Gennadievich; Kralkina, Elena Alexandrovna; Pavlov, Vladimir Borisovich; Alexandrov, Andrej Fedorovich; and Rukhadze, Anri Amvrosievich, 6,040,547, Cl. 219-121.430.

Kondratek, Glen M.: *See*—
Mather, Carl; Quigley, Douglas J.; and Kondratek, Glen M., 6,039,382, Cl. 296-107.010.

Konefal, Robert S.; and Vander, Noel T., to Owens-Brockway Prescription Products Inc. Child resistant package. 6,039,195, Cl. 215-209.000.

Könemann, Bernd: *See*—
Krettek, Christian; Könemann, Bernd; Perrier, Alexandre; and Senn, Peter, 6,039,742, Cl. 606-96.000.

Kong, Katherine: *See*—
Roussel, Patrice; Chennupaty, Srinivas; Cranford, Mike; Abdallah, Mohammad; Coke, Jim; and Kong, Katherine, 6,041,404, Cl. 712-210.000.

Kong, Sik On, to Chartered Semiconductor Manufacturing, Ltd. Constant current programming waveforms for non-volatile memories. 6,040,996, Cl. 365-185.190.

Konica Corporation: *See*—
Haneda, Satoshi; Tokimatsu, Hiroyuki; Onodera, Masahiro; and Hamada, Shuta, 6,041,204, Cl. 399-159.000.
Makino, Masanori; Mochizuki, Hirotake; Misawa, Takao; and Tsuda, Takao, 6,040,891, Cl. 355-46.000.
Mano, Shigeru; Watanabe, Hiroshi; Fukumuro, Kaori; and Yamaya, Yorihiro, 6,040,267, Cl. 503-201.000.
Nakanishi, Tatsuo; Hamaguchi, Shinichi; and Kijima, Eiichi, 6,040,105, Cl. 430-127.000.

König, Hartmann: *See*—
Vogelbacher, Uwe Josef; Keil, Michael; Klintz, Ralf; Wahl, Josef; Wingert, Horst; König, Hartmann; Rack, Michael; Götz, Roland; and Teles, Joaquim Henrique, 6,040,458, Cl. 548-371.100.

Konigova, Otylie: *See*—
Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.

Konings, John, to Quantum Corporation. Disk drive disk damper. 6,040,957, Cl. 360-98.080.

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Beerends, John Gerard, 6,041,294, Cl. 704-203.000.

Konno, Katsushige: *See*—
Kawawada, Naoki; Namiki, Hiroaki; Takehara, Isamu; Iwaki, Tadao; Ishida, Takashi; Hayashizaki, Shinichi; Shimaguchi, Hirotada; and Konno, Katsushige, 6,040,648, Cl. 310-90.000.

Konno, Shinichi: *See*—
Hisano, Seiichi; Saito, Kazuhisa; Sano, Kazushi; Konno, Shinichi; Horikawa, Yoshichika; and Aihara, Yasuhiko, 6,040,043, Cl. 428-323.000.

Konosu, Koji; Sugiura, Akio; and Motizuki, Kunihiro, to Denso Corporation. Optical information reading apparatus having dust-proof plate. 6,039,256, Cl. 235-462.430.

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Trieb, Herbert, 6,039,171, Cl. 198-699.000.

Konrad, Johann: *See*—
Herden, Werner; Konrad, Johann; Jahn, Hans-Peter; Knapp, Martin; Fuessl, Hans-Peter; and Qu, Ning, 6,040,204, Cl. 438-109.000.

Konstantin, Peter: *See*—
Wu, Xiaosong; Shertok, Joel; and Konstantin, Peter, 6,039,872, Cl. 210-500.350.

Konta, Hiroshi: *See*—
Ichioka, Ryoji; Yamakawa, Shinobu; Okino, Hirohito; Kato, Hajime; Iwayama, Kazuyoshi; Konta, Hiroshi; and Kitamura, Akira, 6,040,490, Cl. 585-475.000.

Koo, Hyoung Mo, to SamSung Electronics Co., Ltd. Air conditioner capable of controlling an amount of bypassed refrigerant according to a temperature of circulating refrigerant. 6,038,873, Cl. 62-196.400.

Koole, Leo Hendrik, to Biomat B.V. Radiopaque polymers and methods for preparation thereof. 6,040,408, Cl. 526-292.100.

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Raith, Alex K.; Ramesh, Rajaram; Molnar, Karl; Koilpillai, R. David; and Koorapaty, Havish, 6,040,800, Cl. 342-387.000.

Kooy, Hanne M.; Hacker, Fred L.; and Bellerive, Marc R., to Radionics, Inc. Jaw and circular collimator. 6,041,101, Cl. 378-147.000.

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Schantz, Matthäus; Köppl, Franz; and Flottmann, Dirk, 6,040,544, Cl. 209-577.000.

Kordina, Olle: *See*—
Ellison, Alex; Kordina, Olle; Gu, Chun-Yuan; Hallin, Christer; Janzen, Erik; and Tuominen, Marko, 6,039,812, Cl. 118-725.000.

Korea Advanced Institute Science and Technology: *See*—
Huh, Kyung Bum; and Kim, Kwang Joon, 6,040,678, Cl. 318-701.000.

Korea Atomic Energy Research Institute: *See*—
Oh, Won Zin; Lee, Kune Woo; Choi, Wang Kyu; Park, Hyun Soo; Kim, Jong Seung; Cho, Moon Hwan; and Kim, Jong Kook, 6,040,462, Cl. 549-352.000.

Korea Electric Power Corporation: *See*—
Oh, Won Zin; Lee, Kune Woo; Choi, Wang Kyu; Park, Hyun Soo; Kim, Jong Seung; Cho, Moon Hwan; and Kim, Jong Kook, 6,040,462, Cl. 549-352.000.

Korea Institute of Science and Technology: *See*—

Lee, Yoon Pyo; Lee, Chun Sik; Kim, Kwang Ho; Jurng, Jong Soo; Kim, Young Il; Shin, Hung Tae; and Han, Hee Suk, 6,038,869, Cl. 62-100.000.

Korea Kumho Petrochemical Co., Ltd.: *See*—
Ko, Young-Hoon; Lee, Jung-Goo; and Kim, Jae-Yoon, 6,040,390, Cl. 525-338.000.

Korenberg, Julie R., to Cedars-Sinai Medical Center. Congenital heart disease proteins and products related thereto. 6,040,429, Cl. 530-350.000.

Kori, Moris: *See*—
Yudovsky, Joseph; and Kori, Moris, 6,040,011, Cl. 427-255.280.

Korilis, Ioannis A.: *See*—
Ahuja, Sudhir R.; Korilis, Ioannis A.; and Varvarigou, Theodora A., 6,041,307, Cl. 705-8.000.

Koriseva, Juha: *See*—
Kytönen, Pauli; Koriseva, Juha; and Leinonen, Erkki, 6,039,840, Cl. 162-205.000.

Korpak Limited: *See*—
MacKinnon, Robin, 6,039,101, Cl. 156-443.000.

Korsunsky, Iosif; Grabbe, Dimitry; Hasircoglu, Alex; Schroepfer, Richard; and Ringler, Daniel Robert, to Whitaker Corporation, The. Configurable ground plane. 6,039,583, Cl. 439-101.000.

Kosaka, Tadayoshi; Toyoda, Osamu; and Namiki, Fumihiro, to Fujitsu Limited. Method of forming barrier ribs of display panel. 6,039,622, Cl. 445-52.000.

Koshiba, Takeshi; Matsuoka, Masahiro; and Takayama, Kuniharu, to Fujitsu Limited. Virtual clay system and its method of simulation. 6,040,840, Cl. 345-441.000.

Koshinski, Casmir J., to Pittsburgh Mineral and Environmental Technology, Inc. Method and apparatus for reducing the carbon content of combustion ash and related products. 6,038,987, Cl. 110-344.000.

Koshy, Jacob; Thomas, Jijimon Kumpukkattu; Kurian, Jose; Yadava, Yogendra Prasad; and Damodaran, Alathoor Damodaran, to Council of Scientific & Industrial Research. Preparation of superconducting films and a process for preparing the films. 6,040,275, Cl. 505-471.000.

Kosiec, Jeannie Han, to Motorola, Inc. Resistorless low-current CMOS voltage reference generator. 6,040,720, Cl. 327-83.000.

Kost, Joseph; Pliquett, Uwe; Mitragotri, Samir S.; Langer, Robert S.; and Weaver, James C., to Massachusetts Institute of Technology. Effect of electric field and ultrasound for transdermal drug delivery. 6,041,253, Cl. 604-20.000.

Kostka, Stanley J.; and Pan, Rennan, to Aquatrols Corporation of America, Inc. Agrochemical emulsion concentrates. 6,039,966, Cl. 424-405.000.

Kotani, Hiroyuki: *See*—
Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.

Kotani, Tooru: *See*—
Mori, Kenichi; Ito, Katsuya; Kotani, Tooru; Suzuki, Toshitake; and Sasaki, Yasushi, 6,039,444, Cl. 347-105.000.

Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei; and Mitsuya, Yoshihide, 6,039,484, Cl. 401-52.000.
Kageyama, Hidehei; Mitsuya, Yoshihide; and Ebinuma, Tadayoshi, 6,039,485, Cl. 401-67.000.

Kou, Wen Long: *See*—
Shinya, Keigo; Kou, Wen Long; Suzuki, Osamu; and Tetsui, Shunichi, 6,040,556, Cl. 219-133.000.

Kouchi, Shuichiro: *See*—
Hotta, Yasuhiro; and Kouchi, Shuichiro, 6,040,999, Cl. 365-200.000.

Kouda, Toshiyuki: *See*—
Yamamoto, Hiroshi; Niwa, Hisao; Kojima, Yoshihiro; Maruno, Susumu; Kayashima, Kazuhiro; Kouda, Toshiyuki; Maekawa, Hidetsugu; Ito, Satoru; and Shimeki, Yasuharu, 6,041,141, Cl. 382-231.000.

Koullias, Iconomos A.: *See*—
Nelson, Dale H.; and Koullias, Iconomos A., 6,040,728, Cl. 327-292.000.

Kovac, S. Robert. System and a method for the long term cure of recurrent urinary female incontinence. 6,039,686, Cl. 600-30.000.

Kovandova, Martina: *See*—
Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.

Kowalcyzk, Dennis. Washout assembly for cement mixer vehicle. 6,039,468, Cl. 366-41.000.

Kowalczyk, Karen. Readily cleanable litter cleaning system. 6,039,368, Cl. 294-1.300.

Kowalyshen, Henry W.: *See*—
French, Thomas G.; Guio, Raphael H.; Kowalyshen, Henry W.; McGlone, Buddy B.; Mears, Gregory C.; and Opfer, John C., 6,040,538, Cl. 200-293.000.

Koyama, Jun: *See*—
Zhang, Hongyong; Koyama, Jun; and Teramoto, Satoshi, 6,040,589, Cl. 257-59.000.

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Koyama, Osamu. Projection type display apparatus with color optimized anti-reflection films. 6,040,881, Cl. 349-8.000.

Koyama, Yoshinari: *See*—
Watanabe, Yoshitane; Suzuki, Keitaro; Koyama, Yoshinari; and Iijima, Motoko, 6,040,372, Cl. 524-413.000.

Kozakiewicz, Joseph J.: *See*—
Davies, William Bloor; Healy, John Edward; Miller, Gary Kaui Lani; Kozakiewicz, Joseph J.; and Ryles, Roderick G., 6,039,881, Cl. 210-732.000.

Kozicek, James Richard: *See*—
Erhart, Richard Alexander; and Kozicek, James Richard, 6,040,815, Cl. 345-98.000.

Kozol, John E.: *See*—
Long, David C.; Moyer, Thomas P.; O'Neil, Keith C.; Perry, Charles H.; Pomerantz, Glenn A.; Case, James R.; Kando, Laszlo; and Kozol, John E., 6,038,931, Cl. 73-850.000.

Kozyrev, Sergei: *See*—
Bashlov, Nikolai L.; Vul, Alexandr Y.; Kidalov, Sergei V.; Kozyrev, Sergei; Milenin, Vyacheslav M.; and Timofeev, Nikolai A., 6,040,658, Cl. 313-637.000.

Kragle, Harry A.: *See*—
Brew, Thomas W.; and Kragle, Harry A., 6,039,908, Cl. 264-177.120.

Kraiczyk, Josef; and Mulders, Stephanus, to Siemens Aktiengesellschaft. Contact spring having an improved electrical contact. 6,039,601, Cl. 439-500.000.

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Kralkina, Elena Alexandrovna: *See*—
Antonova, Tatijana Borisovna; Bougrov, Gleb Elmirovich; Kondranin, Sergey Gennadievich; Kralkina, Elena Alexandrovna; Pavlov, Vladimir Borisovich; Alexandrov, Andrej Fedorovich; and Rukhadze, Anri Amvrosievich, 6,040,547, Cl. 219-121.430.

Kramer, Alan: *See*—
Fabbrizio, Vito; and Kramer, Alan, 6,041,321, Cl. 706-41.000.

Kramer, Felix, to Grapha-Holding AG. Gripper releasing device signature conveyor. 6,039,317, Cl. 271-204.000.

Kramer, Jeffrey C.: *See*—
Kelley, David E.; Kramer, Jeffrey C.; Pontell, Jonathan L.; Parral, Loretta S.; Roth, Michelle V.; Yergen, Anoush; and Sanford, Arlene, 6,039,710, Cl. 602-74.000.

Kramer, Joachim: *See*—
Klauser, Thomas; Kramer, Joachim; Meyer, Thomas F.; and Pohlner, Johannes, 6,040,141, Cl. 435-6.000.

Kramer, Manfred: *See*—
Hölzel, Folkhard; Kramer, Manfred; and Tiedemann, Jens, 6,039,072, Cl. 137-512.300.

Krasnansky, Robert: *See*—
Maver, Tammy Lynne; and Krasnansky, Robert, 6,040,368, Cl. 524-110.000.

Krasser, Fritz; and Winkler, Franz, to Ellenberger & Poensgen GmbH. Overcurrent circuit breaker. 6,040,747, Cl. 335-35.000.

Kratschmera, Ralf: *See*—
Schneider, Otto; and Kratschmera, Ralf, 6,040,410, Cl. 528-14.000.

Kratt, Helmut: *See*—
Buck, Manfred; Brost, Wolfgang; Handschuh, Robert; and Kratt, Helmut, 6,039,038, Cl. 125-39.000.

Kraus, Willibald, to TRW Automotive Electronics & Components GmbH & Co. KG. Adjustable connector system. 6,039,523, Cl. 411-48.000.

Krause, Ralf: *See*—
Daberkow, Andreas; Krause, Ralf; Ott, Norbert; and Krouzilek, Rolf, 6,038,981, Cl. 105-168.000.

Krause, Werner; Maier, Franz-Karl; Bauer, Michael; Schuhmann Giampieri, Gabriele; Press, Wolf-Rudiger; and Muschik, Peter, to Schering Aktiengesellschaft. Metal complexes, of DTPA derivatives suitable for use in diagnosis and therapy. 6,040,432, Cl. 534-16.000.

Krautschneider, Wolfgang: *See*—
Reisinger, Hans; Grüning, Ulrike; Wendt, Hermann; Stengl, Reinhard; Lehmann, Volker; Willer, Josef; Franosch, Martin; Schäfer, Herbert; Krautschneider, Wolfgang; Hofmann, Franz; and Böhm, Thomas, 6,040,995, Cl. 365-185.180.

Krawczyk, Dwayne M.; and McFarlin, Mabry M., to Louisiana Bucks Unlimited, L.L.C. Breakable ampule, swab and cap for scent material. 6,039,488, Cl. 401-132.000.

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Reynolds, Kim A.; Marino, Charles P.; and Kray, Kevin P., 6,040,384, Cl. 525-180.000.

KRC-GP, Inc.: *See*—
Selvidge, Charles W.; and Vauk, Dennis A., 6,039,771, Cl. 44-311.000.

Kreibiehl, Markus: *See*—
Birkner, Stefan; Strian, Ernst; and Kreibiehl, Markus, 6,040,059, Cl. 428-469.000.

Kren, Lawrence A.: *See*—
Steinetz, Bruce M.; and Kren, Lawrence A., 6,039,325, Cl. 277-633.000.

Krettek, Christian; Könemann, Bernd; Perrier, Alexandre; and Senn, Peter, to Synthes (U.S.A.). Alignment device for locking the base part of intramedullary nails. 6,039,742, Cl. 606-96.000.

Kreutzig, Norbert: *See*—
Bonny, Pierre; Kreutzig, Norbert; and Sternal, Thorsten, 6,038,769, Cl. 29-890.080.

Kreuz, Ulrich: *See*—
Zollitsch, Ludwig; and Kreuz, Ulrich, 6,039,905, Cl. 264-143.000.

Kreuzer, Franz-Heinrich: *See*—
Häberle, Norman; Kreuzer, Franz-Heinrich; and Küpfer, Jürgen, 6,040,411, Cl. 528-26.000.

Kring, John: *See*—
Danford-Klein, Henrik; and Kring, John, 6,041,318, Cl. 705-400.000.

Kristiansen, Gordon. Disposable dispenser of samples of cosmetic product. 6,039,487, Cl. 401-126.000.

Kristoffersen, Kjell, to Vingmed Sound A/S. Method and apparatus for processing ultrasound signals. 6,039,692, Cl. 600-454.000.

Kritzer, Alan: *See*—
Douglas, Peter; Dudik, Evan; Evans, John; and Kritzer, Alan, 6,039,688, Cl. 600-300.000.

Krivitski, Nikolai M.; and Starostin, Dimitry M., to Transonic Systems, Inc. Single light sensor optical probe for monitoring blood parameters and cardiovascular measurements. 6,041,246, Cl. 600-322.000.

Kroh, Herbert C.: *See*—
Hartman, Terry E.; Kroh, Herbert C.; and Crots, David E., 6,038,889, Cl. 65-319.000.

Krohne Messtechnik GmbH & Co. KG: *See*—
Van der Pol, Roland, 6,040,741, Cl. 330-297.000.

Kroll, Mark W. Disposable external defibrillator. 6,041,255, Cl. 607-5.000.

Krouzilek, Rolf: *See*—
Daberkow, Andreas; Krause, Ralf; Ott, Norbert; and Krouzilek, Rolf, 6,038,981, Cl. 105-168.000.

Krozek, Dennis A.: *See*—
Kennie, Jerry; Cheng, Yi; Hope, Mark E.; Huff, Shean; Nankee, Robert J., II; Joyce, Mary; Krozek, Dennis A.; Moote, Richard K.; Richardson, Roland T.; Rotramel, William D.; and Seitz, Gary L., 6,041,278, Cl. 701-103.000.

Krüger, Christof: *See*—
Pepper, Tammy; Krüger, Christof; and Mäkelä, Matti, 6,039,813, Cl. 127-42.000.

Krumm, Helmut; Kittel, Florenz; Koette, Rolf; and Motzheim, Ralf, to Saint Gobain Vitrage. Method for finishing an extruded seal in situ on a sheet. 6,039,907, Cl. 264-161.000.

Krumm, Valentin: *See*—
Dornier, Peter D.; and Krumm, Valentin, 6,039,086, Cl. 139-54.000.

Kuan Hsieng Industrial Co., Ltd.: *See*—
Sheu, Lih-Ching, 6,039,406, Cl. 301-108.400.

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Nishikawa, Kohei; Shibouta, Yumiko; and Kubo, Keiji, 6,040,324, Cl. 514-381.000.

Kubo, Yuhki: *See*—
Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.

Kubota Corporation: *See*—
Ishimori, Shozo; Yamaguchi, Masatoshi; Auvergne, Cristophe; and Leguillette, Bertrand, 6,038,840, Cl. 56-13.300.

Kubota, Kazuhide; and Miyabayashi, Toshiyuki, to Seiko Epson Corporation. Ink jet recording ink and method. 6,039,796, Cl. 106-31.600.

Kubota, Minoru: *See*—
Yamaguchi, Atsuyoshi; and Kubota, Minoru, 6,038,764, Cl. 29-854.000.

Kubota, Norikazu, to Sanyo Electric Co., Ltd. Low NO_x burner and method of controlling recirculation of exhaust gas. 6,039,560, Cl. 431-9.000.

Kubota, Rie, to International Business Machines Corporation. Information search method, information search device, and storage medium for storing an information search program. 6,041,323, Cl. 707-5.000.

Kucklick, Theodore: *See*—
Edwards, Stuart D.; Wehman, Thomas C.; Parker, Theodore L.; Kucklick, Theodore; Skalnyi, Eugene V.; and Stein, Alan, 6,039,757, Cl. 623-1.000.

Kuczynski, Otto. Resettable puzzle. 6,039,318, Cl. 273-153.00S.

Kudo, Kenji; Kuwabara, Kohji; Yamashita, Shigeharu; Fuchigami, Kazutoshi; and Katsuyama, Norikazu, to Fujitsu Limited. DC-DC converter unit. 6,040,987, Cl. 363-21.000.

Kudoh, Kazuhiro, to NEC Corporation. Device and method for facilitating selection of a selective calling receiver radio area. 6,041,218, Cl. 455-38.400.

Kudu Indutries, Inc.: *See*—
Mills, Robert A. R., 6,039,115, Cl. 166-68.500.

Kugler, Alison: *See*—
Motyka, Andrea Lee; Broaze, Guy; and Kugler, Alison, 6,040,071, Cl. 428-704.000.
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Kuhn, Thomas: *See*—
John, Thomas; Kuhn, Thomas; and Nehse, Wolfgang, 6,041,276, Cl. 701-67.000.

Kuhn, William P.: *See*—
Khanna, Yash P.; Puterbuagh, Frank H., Jr.; Kuhn, William P.; and Schena, Martin J., 6,040,392, Cl. 525-432.000.

Kuklinski, Robert, to United States of America, Navy. Method and apparatus for producing gas bubbles in a liquid medium. 6,039,309, Cl. 261-1.000.

Kulakowski, John Edward: *See*—
Hammar, Jerry Walter; Kulakowski, John Edward; Means, Rodney Jerome; and Dang, Chi-Hung, 6,041,026, Cl. 369-36.000.

Kulicke & Soffa Investments, Inc.: *See*—
Toner, Eugene M., 6,039,234, Cl. 228-4.500.

Kumagai, Masato: *See*—
Sato, Hisaaki; Kumagai, Masato; and Araki, Tomoaki, 6,039,027, Cl. 123-399.000.

Kumano, Youichi: *See*—
Kurata, Tomoyuki; Kumano, Youichi; and Takahashi, Kazuya, 6,039,405, Cl. 301-43.000.

Kun Teng Industry Co., Ltd.: *See*—
Keller, Josef, 6,039,671, Cl. 475-296.000.

Kunishi, Shinsuke, to Molex Incorporated. Electrical connector with relatively movable two-part housing. 6,039,590, Cl. 439-247.000.

Kunzelman, Kevin; and Hutto, Sterling, to Electric Classified, Inc. Common session token system and protocol. 6,041,357, Cl. 709-228.000.

Kupfer, Abraham; Kupfer, Hannah; and Monks, Colin R. F., to National Jewish Medical and Research Center. Method and assay for regulation of T cell proliferation. 6,040,152, Cl. 435-29.000.

Kupfer, Hannah: *See*—
Kupfer, Abraham; Kupfer, Hannah; and Monks, Colin R. F., 6,040,152, Cl. 435-29.000.

Küpfer, Jürgen: *See*—
Häberle, Norman; Kreuzer, Franz-Heinrich; and Küpfer, Jürgen, 6,040,411, Cl. 528-26.000.

Kuramitsu, Masayuki; Saitou, Mitsuo; Maeno, Yutaka; and Hara, Takefumi, to Fuji Photo Film Co., Ltd. Method for producing silver halide emulsion and photographic material containing the same. 6,040,127, Cl. 430-567.000.

Kurasawa, Yoshihiro; and Nishida, Koji, to Mitsubishi Engineering-Plastics Corporation. Closed secondary battery container. 6,040,084, Cl. 429-176.000.

Kurata, Mamoru; and Nakamura, Shin, to Kabushiki Kaisha Toshiba. Method of analyzing semiconductor device operation, method of analyzing specific physical phenomena, and apparatus for performing these methods. 6,041,424, Cl. 714-33.000.

Kurata, Tomoyuki; Kumano, Youichi; and Takahashi, Kazuya, to Bridgestone Corporation. Segment mounted on vehicle wheel or endless rubber track. 6,039,405, Cl. 301-43.000.

Kurdzo, James Patrick; and Zakrzewski, Robert Alan, to General DataComm, Inc. Voice server module for ATM switch. 6,041,064, Cl. 370-466.000.

Kurian, Jose: *See*—
Koshy, Jacob; Thomas, Jijimon Kumpukkattu; Kurian, Jose; Yadava, Yogendra Prasad; and Damodaran, Alathoor Damodaran, 6,040,275, Cl. 505-471.000.

Kurihara, Katsuki: *See*—
Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, 6,040,520, Cl. 136-245.000.

Kurihara, Toshiyuki: *See*—
Okamoto, Masakazu; and Kurihara, Toshiyuki, 6,038,866, Cl. 62-6.000.

Kuriyama, Chojiro, to Rohm Co., Ltd. Method for manufacturing a solid electrolytic capacitor array. 6,040,229, Cl. 438-396.000.

Kuriyama, Hiroshi: *See*—
Edatsune, Isao; Kuriyama, Hiroshi; and Urano, Osamu, 6,040,918, Cl. 358-296.000.

Kurmis, Viktor, to Paul Hellerman GmbH. Tool for tying cable harnesses. 6,039,089, Cl. 140-93.200.

Kuroda, Akikazu: *See*—
Toyama, Yoshiharu; Kuroda, Akikazu; Kiyama, Tokuji; Kida, Sumio; Yoshida, Shunji; Yamamoto, Takashi; and Atsumi, Tetsuya, 6,039,809, Cl. 118-715.000.

Kuroda, Ryo: *See*—
Shido, Shunichi; and Kuroda, Ryo, 6,040,848, Cl. 347-159.000.

Kuroda, Tetsuo; Miyasaka, Matsuho; and Takahashi, Norio, to Ebara Corporation. Absorption chiller-heater and method for forming initial anticorrosive film therefor. 6,038,882, Cl. 62-476.000.

Kurogane, Saori; and Sakamoto, Hiromi, to Sharp Kabushiki Kaisha. Thin film transistor. 6,040,206, Cl. 438-149.000.

Kurosawa, Motoharu; and Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Coin distributor. 6,039,643, Cl. 453-3.000.

Kurosawa, Motoharu: *See*—
Abe, Hiroshi; and Kurosawa, Motoharu, 6,039,166, Cl. 194-317.000.

Kurose, Shigeo: *See*—
Okada, Kesao; and Kurose, Shigeo, 6,040,034, Cl. 428-143.000.

Kurple, Kenneth R. Foundry curing system. 6,040,355, Cl. 523-139.000.

Kurtin, Stephen; and Epstein, Saul, to Lane Research. Variable spectacle lens. 6,040,947, Cl. 359-666.000.

Kurtz, Karl-Rudolf: *See*—
Telser, Thomas; Huemmer, Wolfgang; and Kurtz, Karl-Rudolf, 6,040,116, Cl. 430-306.000.

Kusano, Manabu: *See*—
Takeshita, Naoki; Kusano, Manabu; Sagawa, Fumihiko; and Nakagawa, Taizo, 6,040,529, Cl. 174-254.000.

Kushihi, Yuichi; and Shikata, Masaru, to Murata Manufacturing Co., Ltd. Circular-polarization antenna. 6,040,806, Cl. 343-853.000.

Kushiya, Katsumi; Okumura, Daisuke; and Sugiyama, Ichiro, to Showa Shell Sekiyu K.K. N-type window layer for a thin film solar cell and method of making. 6,040,521, Cl. 136-265.000.

Kusmiss, John H.; and Caryl, Naomi. Self-mobile cat toy. 6,039,628, Cl. 446-457.000.

Kustka, George John: *See*—
Doshi, Bharat Tarachand; Dravida, Subrahmanyam; Kustka, George John; Magill, Peter D.; Siller, Curtis A.; and Sriram, Kotikalapudi, 6,041,051, Cl. 370-352.000.

Kusunoki, Akihiko; Kawamura, Naohisa; Sugizaki, Yoshiki; and Kuwahara, Akio, to Saitama Daiichi Pharmaceutical Co., Ltd. Composition for skin patch preparation and process for preparing the same. 6,039,971, Cl. 424-443.000.

Kutchko, Joseph. Buoyant deodorizer bar. 6,039,938, Cl. 424-76.100.

Kuwabara, Kohji: *See*—
Kudo, Kenji; Kuwabara, Kohji; Yamashita, Shigeharu; Fuchigami, Kazutoshi; and Katsuyama, Norikazu, 6,040,987, Cl. 363-21.000.

Kuwahara, Akio: *See*—
Kusunoki, Akihiko; Kawamura, Naohisa; Sugizaki, Yoshiki; and Kuwahara, Akio, 6,039,971, Cl. 424-443.000.

Kuwahara, Tohru: *See*—
Yamada, Chuji; Kobayashi, Shin; Ogawa, Makoto; Kuwahara, Tohru; and Okumura, Eiji, 6,039,157, Cl. 188-158.000.

Kvaerner Oilfield Products: *See*—
Wilkins, Robert Lee; and Moles, Peter, 6,039,120, Cl. 166-368.000.

Kvarnström, Bo: *See*—
Niska, Håkan; Kvarnström, Bo; and Oom, Jan, 6,041,228, Cl. 455-419.000.

KVH Industries, Inc.: *See*—
Monte, Thomas D., 6,041,149, Cl. 385-2.000.

Kwon, Yong Chin. Quick change side full hoist ring assembly. 6,039,500, Cl. 403-78.000.

Kyker, Alan B.: *See*—
Parker, Donald D.; Boggs, Darrell D.; and Kyker, Alan B., 6,041,403, Cl. 712-210.000.

Kyocera Corporation: *See*—
Suguro, Akihiro, 6,041,220, Cl. 455-90.000.

Kyodo Shiko Co., Ltd.: *See*—
Tokita, Yoshiaki; and Takagi, Takahiro, 6,040,024, Cl. 428-35.200.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Sota, Akio; Okiura, Tomoo; and Azuma, Masaki, 6,039,782, Cl. 71-10.000.

Kytönen, Pauli; Koriseva, Juha; and Leinonen, Erkki, to Valmet Corporation. Roll for a supercalender and method for calendering a web. 6,039,840, Cl. 162-205.000.

Labatte, Timothy E. W.: *See*—
Shipman, Mark S.; Christeson, Orville H.; and Labatte, Timothy E. W., 6,041,385, Cl. 710-200.000.

LaBerge, Paul A., to Micron Electronics, Inc. Method for increasing the number of devices capable of being operably connected to a host bus. 6,041,380, Cl. 710-129.000.

Laboratoire Central des Ponts et Chaussees: *See*—
Delagnes, Philippe; and Barba, Dominique, 6,040,853, Cl. 348-128.000.

Laboratoires Prographarm: *See*—
Gendrot, Edouard; Cousin, Gérard; Ragot, Françoise; and Clee-Bouvet, Marie-Christine, 6,039,979, Cl. 424-497.000.

Labsystems Oy: *See*—
Tuunanen, Jukka, 6,040,192, Cl. 436-177.000.

Laby, Jordan M.: *See*—
Henkin, Melvyn L.; and Laby, Jordan M., 6,039,886, Cl. 210-776.000.

Lacroix, Eric: *See*—
Bertocchio, Rene; Lacroix, Eric; and Perdrieux, Sylvain, 6,039,845, Cl. 203-57.000.

Lada, Henry F., Jr., to Compaq Computer Corporation. Circuit for reducing audio amplifier noise during powering on and off. 6,041,416, Cl. 713-330.000.

Ladd, Arnold M.: *See*—
Suffi, Louis; and Ladd, Arnold M., 6,039,578, Cl. 439-54.000.

Ladds, David Anthony, to Horstmann Timers & Controls Limited. Electricity measurement using two conductors. 6,040,690, Cl. 324-142.000.

Laengerer & Reich GmbH & Co.: *See*—
Strähle, Roland, 6,039,110, Cl. 165-10.000.

La Ferla, Raffaele: *See*—
Fay, Thomas F., III; La Ferla, Raffaele; Sherman, Andrew J.; and Stankiewicz, Edwin P., 6,040,266, Cl. 502-439.000.

Lafuma, Francoise: *See*—
Iliopoulos, Ilias; Lafuma, Francoise; Gillet, Jean-Philippe; and Pezron, Erwoan, 6,040,386, Cl. 525-329.900.

Lähteenmäki, Ari, to Suunto Oyj. Face shield, incorporating a wrist watch display. 6,039,446, Cl. 351-43.000.

L' Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation de Procedes Georges Claude: *See*—
Marles Franco, Joan, 6,039,786, Cl. 75-414.000.

Lakhansingh, Cynthia. Portable digital radio and compact disk player. 6,041,023, Cl. 369-7.000.

LaLange, Jacques; and Pamart, Olivier, to Whitaker Corporation, The. Electrical connector with a shunt incorporated into a secondary locking member. 6,039,589, Cl. 439-188.000.

LaLiberte, Thomas R.: *See*—
Miller, Philip; and LaLiberte, Thomas R., 6,039,911, Cl. 264-280.000.

L' Allier, James J.; Welsh, Sally H.; Nielsen, Boyd W.; Miles, Kurt W.; Myers, Ken L.; Henrie, Stephen P.; Norberg, Michael I.; and Helliwell, Laura I., to National Education Corporation. Interactive learning system with pretest. 6,039,575, Cl. 434-323.000.

Lallier, Jean-Pierre; Marie, Patrick; Aubry, Jean-Marie; Marti, Marie-José; and Del Nero, Valérie, to Elf Atochem, S.A. Composition for stripping paints, varnishes or lacquers. 6,040,285, Cl. 510-206.000.

Lam, Chung H., to International Business Machines Corporation. Two square NVRAM cell. 6,040,218, Cl. 438-259.000.

Lam, Raymond K. F.; Melin, Charles E.; and Colella, Guiseppe, to Sony Corporation; and Materials Research Corporation. Melting and casting of high purity chromium with controlled oxygen content. 6,039,788, Cl. 75-623.000.

LAM Research Corporation: *See*—
Dhindsa, Rajinder; Singh, Vikram; and Tokunaga, Ken, 6,039,836, Cl. 156-345.000.

Lam, Robert: *See*—
Watson, Fred W.; Hannock, Wayne; Lam, Robert; and Evans, George, 6,038,979, Cl. 102-481.000.

Lambelet, Lawrence E., Jr., to Ortho Pharmaceutical Corporation. Variable day start tablet dispenser. 6,039,208, Cl. 221-25.000.

Lamberg, Fredrik, to Seco Tools AB. Drill having radially overlapping indexable cutting inserts. 6,039,515, Cl. 408-188.000.

Lambert, Jeffrey W. Wall mounted pivoting work bench. 6,039,416, Cl. 312-245.000.

Lamers Beheer B.V.: *See*—
Lamers, Jacobus Stephanus, 6,040,018, Cl. 427-510.000.

Lamers, Jacobus Stephanus, to Lamers Beheer B.V. Method for reinforcing a board, sheet or foil. 6,040,018, Cl. 427-510.000.

Lancaster, Robert A.: *See*—
Chen, Jiann H.; Lancaster, Robert A.; Tsou, Andy H.; and Anderson, Charles C., 6,041,210, Cl. 399-333.000.

Landon, Gregory L.: *See*—
Peeters, Kenneth J.; and Landon, Gregory L., 6,038,844, Cl. 56-377.000.

Lands, Michael J.: *See*—
Buysse, Steven P.; Kennedy, Jenifer S.; Lands, Michael J.; Loeffler, Donald R.; Lukianow, S. Wade; and Ryan, Thomas P., 6,039,733, Cl. 606-40.000.

Lane, James N.: *See*—
Neeley, Rocky E.; and Lane, James N., 6,038,893, Cl. 70-175.000.

Lane, Norman. Dynamic pressure regulator cushion. 6,038,956, Cl. 91-409.000.

Lane Research: *See*—
Kurtin, Stephen; and Epstein, Saul, 6,040,947, Cl. 359-666.000.

Lang, Feng, to Prime Hill Development Limited. Motor vehicle air-conditioning system. 6,038,876, Cl. 62-238.400.

Lang, Lowell, deceased (by Marilyn Lang, legal representative): *See*—
Green, H. Dean; Salquero, George J.; Lang, Lowell, deceased, 6,041,310, Cl. 705-27.000.

Lang, Marilyn, legal representative: *See*—
Green, H. Dean; Salquero, George J.; Lang, Lowell, deceased, 6,041,310, Cl. 705-27.000.

Lang, Stephen Michael: *See*—
Barlow, Yvonne Margaret; and Lang, Stephen Michael, 6,039,972, Cl. 424-445.000.

Langer, Günter: *See*—
Pawlowski, Christoph; Langer, Günter; and Meyer, Wilhelm, 6,039,328, Cl. 280-7.130.

Langer, Robert S.: *See*—
Kost, Joseph; Pliquett, Uwe; Mitragotri, Samir S.; Langer, Robert S.; and Weaver, James C., 6,041,253, Cl. 604-20.000.

Langner, Roland: *See*—
Ley, Jakob; and Langner, Roland, 6,039,939, Cl. 424-78.030.

Lantis, John C: *See*—
Durville, Frederick M.; Connolly, Raymond J; Lantis, John C; Rediker, Robert H; and Schwaitzberg, Steven D., 6,039,729, Cl. 606-16.000.

Lanzi, Ronald George: *See*—
Krajewski, Paul Edward; Lanzi, Ronald George; and Schroth, James Gregory, 6,038,911, Cl. 72-379.200.

Laor, Raviv, to OneClip.com, Incorporated. Method of and system for distributing and redeeming electronic coupons. 6,041,309, Cl. 705-14.000.

LAP Licensing, LC.: *See*—
Cox, James Stacy, 6,039,003, Cl. 119-166.000.

LaPlante, Jeffrey P.: *See*—
Kubalak, Thomas P.; Sheperd, Peter; and LaPlante, Jeffrey P., 6,039,750, Cl. 606-201.000.

La Porta, Thomas F.; and Netravali, Arun N., to Lucent Technologies, Inc. Interactive call identification. 6,041,103, Cl. 379-67.100.

Laporte, Jean-Jacques; Tassily, Eric; and Muttin, Frédéric, to GEC Alsthom Transport SA. Devices with inflatable members for protecting vehicles against impacts. 6,039,349, Cl. 280-748.000.

Larguier, René. Electric motor/thermal engine drive for a vehicle in which the electric motor functions as a flywheel, starter motor, and generator. 6,040,634, Cl. 290-45.000.

LaRoche, Yves Rene: *See*—
Vlasuk, George Phillip; Stanssens, Patrick Eric Hugo; Messens, Joris Hilda Lieven; Lauwereys, Marc Josef; LaRoche, Yves Rene; Jespers, Laurent Stephane; Gansemans, Yannick Georges Jozef; Moyle, Matthew; and Bergum, Peter W., 6,040,441, Cl. 536-252.000.

Larreacorp, Ltd.: *See*—
Sinnott, Robert A.; Clark, W. Dennis; and DeBoer, Kenneth Frank, 6,039,955, Cl. 424-195.100.

Lars Barthold Nielsen: *See*—
Kolstrup, Anders Peter, 6,039,668, Cl. 475-183.000.

Larsen, Jody D.: *See*—
Sandhu, Gurtej S.; Elliott, Richard L.; Doan, Trung T.; and Larsen, Jody D., 6,040,245, Cl. 438-692.000.

Larsen, Robert D.: *See*—
Corley, Edward G.; Davies, Ian W.; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, 6,040,319, Cl. 514-334.000.
Davies, Ian W.; Journet, Michel; Gerena, Linda; Larsen, Robert D.; Pye, Philip J.; and Rossen, Kai, 6,040,450, Cl. 546-256.000.

Larson, John A.; Gretz, Thomas J.; and Ofcharsky, John, to Plastic Components, Inc. Variable width sill support. 6,038,821, Cl. 52-97.000.

Larson, Margaret J.; Rutter, John W.; and Smith, Larry L., to Sonotech, Inc. Coupling sheath for ultrasound transducers. 6,039,694, Cl. 600-459.000.

Larsson, Björn, to SCA Hygiene Products AB. Adhesive fastening device. 6,039,717, Cl. 604-391.000.

Larsson, Lennart; and Folkesson, Rolf, to Allgon Ab. Method and system for tuning resonance modules. 6,041,083, Cl. 375-304.000.
Laser Technology, Inc.: *See*—
Clifford, Bruce; and Harrison, John, 6,040,897, Cl. 356-4.010.
Lashkari, Yezdezard Z.: *See*—
Chislenko, Alexander; Lashkari, Yezdezard Z.; and McNulty, John E., 6,041,311, Cl. 705-27.000.
Lasky, Laurence A.; and Dowbenko, Donald J., to Genentech, Inc. Tyrosine phosphorylated cleavage furrow-associated proteins (PSTPIPS). 6,040,437, Cl. 536-23.100.
Lassen, Soren Flensted; Bech, Lisbeth; Ohmann, Anders; Breinholt, Jens; Fuglsang, Claus Crone; and Ostergaard, Peter Rahbek, to Novo Nordick A/S. Phytase polypeptides. 6,039,942, Cl. 424-94.600.
Laswell, William L.: *See*—
Duggan, Mark E.; Halczenko, Wasyl; Egbertson, Melissa S.; Hartman, George D.; and Laswell, William L., 6,040,317, Cl. 514-317.000.
Lattes, Isabelle; Feurer, Bernard; Guidetti, Brigitte; and Payrou, Viviane, to Chauvin Opsia. Fluorinated organic compounds, ophthalmological applications thereof and method for making same. 6,040,485, Cl. 570-126.000.
Lattin, Danny L.: *See*—
Compadre, Cesar; Breen, Philip; Salari, Hamid; Fifer, E. Kim; Lattin, Danny L.; Slavik, Michael; Li, Yanbin; and O'Brien, Timothy, 6,039,992, Cl. 426-332.000.
Lau, Jark C.; and Lin, Philip Sim. Method and apparatus for stabilizing a moving low-strength sheet. 6,039,842, Cl. 162-272.000.
Lau, Kai-Hung: *See*—
Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.
Lau, Willie; Kelly, Michael DeWayne; Lorah, Dennis Paul; and Heinley, David Ralph, to Rohm and Haas Company. Polymer compositions. 6,040,409, Cl. 526-328.000.
Läufer, Martin: *See*—
Dieterle, Franz; and Läufer, Martin, 6,040,664, Cl. 315-383.000.
Laugier, Jean-Pierre: *See*—
Cupferman, Sylvie; and Laugier, Jean-Pierre, 6,040,347, Cl. 514-723.000.
Lauman, Brian C.: *See*—
Carr, Raymond A.; and Lauman, Brian C., 6,038,914, Cl. 73-40.000.
Lautenschlager, Wolfgang; and Stahl, Uwe, to Alcatel. Method and apparatus for providing a telecommunications service. 6,041,110, Cl. 379-201.000.
Lauvray, Olivier J.; and Rodriguez, David, to Motorola, Inc. Semiconductor component comprising an electrostatic-discharge protection device. 6,040,604, Cl. 257-355.000.
Lauwereys, Marc Josef: *See*—
Vlasuk, George Phillip; Stanssens, Patrick Eric Hugo; Messens, Joris Hilda Lieven; Lauwereys, Marc Josef; LaRoche, Yves Rene; Jespers, Laurent Stephane; Gansemans, Yannick Georges Jozef; Moyle, Matthew; and Bergum, Peter W., 6,040,441, Cl. 536-252.000.
Law, Marcus Dixon; and Dietz, Jon M., to Novartis Finance Corporation. Use of translationally altered RNA to confer resistance to maize dwarf mosaic virus and other monocotyledonous plant viruses. 6,040,496, Cl. 800-280.000.
Law, R. Thomas. Separator for air conveyed pellets. 6,039,513, Cl. 406-171.000.
Law, Simon M., to Xerox Corporation. Method of building an adaptive huffman codeword tree. 6,040,790, Cl. 341-65.000.
Lawler, John J. Toy animal and habitat clothing. 6,038,698, Cl. 2-69.000.
Lawlor, Elizabeth Jane, to SmithKline Beecham Corporation; and SmithKline Beecham p.l.c. Asparaginyl tRNA synthetase from *streptococcus pneumoniae*. 6,040,163, Cl. 435-183.000.
Lawlor, Elizabeth Jane: *See*—
Gentry, Daniel Robert; Greenwood, Rebecca Claire; and Lawlor, Elizabeth Jane, 6,040,162, Cl. 435-183.000.
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Winter, Jeffrey J.; Holden, Homer N.; and Lawrence, James L., 6,039,082, Cl. 138-121.000.
Lawrence, Kathryn E.: *See*—
Hackler, Ronald E.; and Lawrence, Kathryn E., 6,040,345, Cl. 514-594.000.
Lawson, Richard R.; and Droukas, Roger C. Vacuum drying screen. 6,038,785, Cl. 34-145.000.
Lawton, John W., Jr.: *See*—
Doane, William M.; Lawton, John W., Jr.; and Shogren, Randal, 6,040,063, Cl. 428-532.000.
Layman, Ted W.: *See*—
Quiachon, Dinah B.; Piplani, Alec A.; Baker, Steve G.; Williams, Ronald G.; Williams, Richard S.; Osborn, Kenneth L.; Layman, Ted W.; and Johansson, Peter K., 6,039,758, Cl. 623-1.000.
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Lau, Willie; Kelly, Michael DeWayne; Lorah, Dennis Paul; and Heinley, David Ralph, 6,040,409, Cl. 526-328.000.

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Dondale, Charles Stephen, 6,040,740, Cl. 330-149.000.
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Michel, Alan Dean; and Williams, Eric, 6,041,118, Cl. 379-391.000.
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MacCormack, David Ross: *See*—
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Hoffmann, Eduard; and Prem, Wolfgang, 6,038,975, Cl. 101-375.000.

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Johnson, Kristina M.; and Mao, Chong Chang, 6,040,883, Cl. 349-116.000.

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Rybarczyk, David F.; Mar, Lori S.; Mets, Christiaan M.H.; and Xi, Xiaojin, 6,041,178, Cl. 395-705.000.

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Bowman, Howard L.; Darwin, Robert L.; Maraffio, William M.; Sawyer, Larry D.; Williams, Robert B.; Hudson, Frank E.; Hunstad, Mary; and Decker, Mark W., 6,039,124, Cl. 169-61.000.

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Chopping, Geoffrey, 6,041,055, Cl. 370-391.000.

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Filippi, Giovanni; and Maria van Os, Rudolphus Louis, 6,038,961, Cl. 92-98.00R.

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Chambost, Bernard; Marion, Philippe; and Mathieu, Corinne, 6,040,481, Cl. 564-422.000.

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Stern, Roger A.; Sullivan, Vincent N.; and Marion, Robert L., 6,041,260, Cl. 607-98.000.

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Pettitt, Gregory S.; and Markandey, Vishal, 6,040,876, Cl. 348-624.000.

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Jablonski, Ted M.; Meyer, Michael S.; Miller, David A.; Martin, Herman H.; Emody, Kenneth J.; Levine, Gary S.; and Tinucci, Peter, 6,039,220, Cl. 222-236.000.

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Martin, Ronald G.: *See—*
Grasso, Albert P.; Martin, Ronald G.; and Roche, Robert P., 6,039,823, Cl. 156-89.260.

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Brito, Joao Carlos F.; Rote, John K.; Trafton, Frederick W.; and Martins, Marcus M., 6,040,671, Cl. 318-603.000.

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Maruno, Susumu: *See—*
Yamamoto, Hiroshi; Shimeki, Yasuharu; Kayashima, Kazuhiro; Maruno, Susumu; Fujimoto, Makoto; and Kojima, Yoshihiro, 6,040,825, Cl. 345-173.000.
Yamamoto, Hiroshi; Niwa, Hisao; Kojima, Yoshihiro; Maruno, Susumu; Kayashima, Kazuhiro; Kouda, Toshiyuki; Maekawa, Hidetsugu; Ito, Satoru; and Shimeki, Yasuharu, 6,041,141, Cl. 382-231.000.

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Dawson, Gerald L.; and Redden, James P., 6,038,897, Cl. 70-303.00A.

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Maser, Thomas L.: *See—*
Maddrell, Richard; and Maser, Thomas L., 6,041,215, Cl. 434-317.000.

Mashitani, Ken: *See—*
Hamagishi, Goro; Kanatani, Keiichi; Kishimoto, Shunichi; Sakata, Masahiro; Yamashita, Atsuhiro; Matsushita, Naoki; and Mashitani, Ken, 6,040,807, Cl. 345-6.000.

Maska, Mark S.: *See—*
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Mason, Russell C.: *See—*
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Massachusetts Institute of Technology: *See—*
Fitzgerald, Eugene A.; and Samavedam, Srikanth B., 6,039,803, Cl. 117-89.000.
Kost, Joseph; Pliquett, Uwe; Mitragotri, Samir S.; Langer, Robert S.; and Weaver, James C., 6,041,253, Cl. 604-20.000.

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Massucci, John E.: *See—*
Citron, Howard M.; Asano, David K.; Baietto, Henry R.; Chen, Sullivan S.; De Frondeville, Alexis W.; Hahn, Jeffrey H.; Probst, Thomas J., Jr.; Massucci, John E.; Costin, Dinu; and Peragine, Ralph E., 6,038,952, Cl. 83-605.000.

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Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.

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Masuda, Hideyuki, to Yamaha Corporation. Tone generation system using computer software and storage medium storing the computer software. 6,040,516, Cl. 84-622.000.

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Iida, Michihiko; Kawashima, Tetsuji; Sato, Shoji; and Masuda, Shozo, 6,041,029, Cl. 369-50.000.

Matano, Takashi: *See—*
Kanki, Masahiro; Kawano, Mutsuhiro; and Matano, Takashi, 6,040,356, Cl. 523-160.000.
Takahashi, Kazuhiro; Kobayashi, Toshitake; Takemoto, Masataka; Matano, Takashi; and Ono, Haruo, 6,040,044, Cl. 428-323.000.

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Lam, Raymond K. F.; Melin, Charles E.; and Colella, Guiseppe, 6,039,788, Cl. 75-623.000.

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Mathes, Joachim: *See—*
Muller, Harry; and Mathes, Joachim, 6,039,367, Cl. 293-117.000.

Mathew, Boney A.: *See—*
Martucci, Norman S.; and Mathew, Boney A., 6,039,084, Cl. 138-137.000.

Mathews, Edward Henry. Method of assisting the conducting of a research project. 6,041,303, Cl. 705-1.000.

Mathieu, Corinne: *See—*
Chambost, Bernard; Marion, Philippe; and Mathieu, Corinne, 6,040,481, Cl. 564-422.000.

Matis, Louis A.: *See—*
Rollins, Scott; Rother, Russell P.; Matis, Louis A.; and Evans, Mark J., 6,040,428, Cl. 530-350.000.

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Matsubara, Yoshihisa, to NEC Corporation. Method for forming interconnection structure. 6,040,240, Cl. 438-618.000.

Matsuda, Hideo: *See—*
Tamagaki, Akira; Shimazawa, Yoichi; Matsuda, Hideo; and Yoshiura, Syoichiro, 6,040,924, Cl. 358-523.000.

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Kamon, Koichi; and Matsuda, Shinya, 6,041,146, Cl. 382-274.000.

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Fujikura, Teruhiko; Kinoshita, Naoyoshi; Fujii, Makoto; Matsuhara, Kenji; and Natsume, Munehiro, 6,041,214, Cl. 399-403.000.

Matsui, Eriko: *See—*
Yasuda, Akio; Nito, Keiichi; Matsui, Eriko; Takanashi, Hidehiko; and Bao, Yang Ying, 6,040,884, Cl. 349-129.000.

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Matsumoto, Hiroyuki: *See—*
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Matsumoto, Kenji; Suzuki, Kazuo; and Haga, Muneo, to 3M Innovative Properties Company. Method and apparatus for fabricating a particle-coated substrate, and such substrate. 6,040,004, Cl. 427-185.000.

Matsumoto, Masaru: *See—*
Takeda, Sunao; Kaneko, Yasushi; Tokizawa, Minoru; Eto, Hiromichi; Ishida, Kazuya; Maebashi, Kazunori; Matsumoto, Masaru; Asaoka, Takemitsu; and Sato, Susumu, 6,040,325, Cl. 514-383.000.

Matsunaga, Satoshi: *See—*

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Matsuo, Akihiko: *See*—
Kawabe, Keiko; Matsuo, Akihiko; Kimura, Minako; Nagahashi, Kenji; and Uehara, Sanya, 6,041,177, Cl. 395-704.000.

Matsuoka, Masahiro: *See*—
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Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, 6,040,520, Cl. 136-245.000.

Matsushita Electric Industial Co., Ltd.: *See*—
Ogura, Takashi; and Murata, Kousaku, 6,039,145, Cl. 181-167.000.

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Dischert, Lee Robert, 6,040,869, Cl. 348-448.000.
Etoh, Minoru, 6,040,864, Cl. 348-416.000.
Hayashi, Takaaki; and Etoh, Minoru, 6,041,145, Cl. 382-268.000.
Isomura, Yoshinori; Yasohara, Masahiro; and Takada, Kazuyuki, 6,040,673, Cl. 318-615.000.
Kamada, Takehiro, 6,041,433, Cl. 714-795.000.
Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.
Ohira, Tadashi; Sato, Yoshiaki; and Kodama, Kazuhiko, 6,039,912, Cl. 264-328.100.
Osawa, Toshio, 6,039,588, Cl. 439-164.000.
Otsubo, Kensei; and Yamaguchi, Hideo, 6,041,033, Cl. 369-271.000.
Takamori, Hiroki; and Morisige, Takayuki, 6,041,067, Cl. 370-514.000.
Takeuchi, Yoshiharu; Aburaya, Kiyoji; Yasu, Toshiharu; Tsubokawa, Masahiro; Sakai, Manabu; Aoshika, Shoji; and Narita, Tsutayoshi, 6,039,551, Cl. 418-88.000.
Takubo, Yoneharu, 6,040,813, Cl. 345-92.000.
Tamura, Akihiro; Sakaue, Shigeo; and Hamasaki, Takeshi, 6,040,860, Cl. 348-252.000.
Terai, Kenichi; and Hashimoto, Hiroyuki, 6,041,126, Cl. 381-71.600.
Umeda, Takashi; and Ohno, Motoyasu, 6,040,922, Cl. 358-468.000.
Yamamoto, Hiroshi; Shimeki, Yasuharu; Kayashima, Kazuhiro; Maruno, Susumu; Fujimoto, Makoto; and Kojima, Yoshihiro, 6,040,825, Cl. 345-173.000.
Yamamoto, Hiroshi; Niwa, Hisao; Kojima, Yoshihiro; Maruno, Susumu; Kayashima, Kazuhiro; Kouda, Toshiyuki; Maekawa, Hidetsugu; Ito, Satoru; and Shimeki, Yasuharu, 6,041,141, Cl. 382-231.000.

Matsushita Electric Indutrial Co., Ltd.: *See*—
Ueda, Shigeki; Inada, Ikuhiro; and Uchiyama, Satomi, 6,040,564, Cl. 219-682.000.

Matsushita Electric Works, Ltd.: *See*—
Sakamoto, Hiroshi; and Abe, Hideaki, 6,040,986, Cl. 363-20.000.

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Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.
Nose, Sachiyuki, 6,040,621, Cl. 257-666.000.
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Matsushita, Junichi: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

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Hamagishi, Goro; Kanatani, Keiichi; Kishimoto, Shunichi; Sakata, Masahiro; Yamashita, Atsuhiro; Matsushita, Naoki; and Mashitani, Ken, 6,040,807, Cl. 345-6.000.

Matsutani Chemical Industries Co., Ltd.: *See*—
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Skarpelos, Michael J.; van der Linden, Robbert; Carley, William J.; Lyon, James M.; and McCline, Matthew C., 6,041,420, Cl. 714-7.000.

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McConnell, Kenneth G., to Iowa State University Research Foundation, Inc. Blower fan blade passage rate noise control scheme. 6,039,532, Cl. 415-119.000.

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Jones, John J.; Saggio, Rosario S.; Okamoto, Karlton K.; and Lenoil, Isidor, 6,039,519, Cl. 410-69.000.

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McGrath, James E.: *See*—
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McKay, William F., to SDGI Holdings, Inc. Reinforced bone graft substitutes. 6,039,762, Cl. 623-17.000.

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McMullen, Dillon G.: *See*—
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Melvin, Bruce W., to Hewlett-Packard Company. Flexible multi-frequency repeater. 6,041,065, Cl. 370-492.000.
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Yamamoto, Iwao; Kakikura, Eisaku; Kinouchi, Masami; Inoue, Yoshiaki; and Shiotsu, Tamotsu, 6,040,051, Cl. 428-367.000.

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Gotou, Toyokazu; and Fukakusa, Shinji, 6,040,581, Cl. 250-390.010.
Harada, Akihiko; and Higashitani, Keiichi, 6,040,627, Cl. 257-752.000.
Hata, Toshiaki, 6,039,010, Cl. 123-41.00E.
Kanaoka, Masaru, 6,040,549, Cl. 219-121.610.
Kimura, Mikihiro; and Sekine, Masahiro, 6,040,199, Cl. 438-17.000.
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Nagai, Yukihiro; and Mametani, Tomoharu, 6,040,615, Cl. 257-529.000.
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Takahashi, Hideki, 6,040,599, Cl. 257-330.000.
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Suenaga, Kiyoshi; Tomita, Yasuoki; and Fukuno, Hiroki, 6,039,531, Cl. 415-115.000.

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Mitsubishi Shindoh Co., Ltd.: *See*—
Momose, Mitsuru, 6,040,038, Cl. 428-209.000.

Mitsuhashi, Masashige; Ohno, Kenichi; and Yoshida, Kenichi, to NEC Corporation. Surface polishing apparatus including a dresser. 6,039,635, Cl. 451-72.000.

Mitsui Chemicals, Inc.: *See*—
Karasawa, Akio; Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Ishihara, Yuko, 6,040,111, Cl. 430-270.100.

Mitsui High-tec Inc.: *See*—
Sakai, Nobuo; Ishida, Migaku; and Irie, Junichi, 6,039,511, Cl. 406-46.000.

Mitsui Petrochemical Industrial, Ltd.: *See*—
Ishida, Tatsuyoshi; Yasuda, Masaaki; Onishi, Hitoshi; Kihara, Noriaki; Tsutsui, Toshiyuki; Sagane, Toshihiro; Kawasaki, Masaaki; and Nakahama, Hidenari, 6,040,407, Cl. 526-281.000.

Mitsui, Sunao: *See*—
Koguro, Kiyoto; Oga, Toshikazu; Tokunaga, Norihito; Mitsui, Sunao; and Orita, Ryozo, 6,040,454, Cl. 548-253.000.

Mitsumori, Kenichi: *See*—
Yeol, Oh Eui; Mitsumori, Kenichi; and Miyazawa, Satoshi, 6,039,815, Cl. 134-2.000.

Mitsuya, Yoshihide: *See*—
Kageyama, Hidehei; and Mitsuya, Yoshihide, 6,039,484, Cl. 401-52.000.
Kageyama, Hidehei; Mitsuya, Yoshihide; and Ebinuma, Tadayoshi, 6,039,485, Cl. 401-67.000.

Mittersinker, Gregor: *See*—
Cornelius, Dirk L.; and Mittersinker, Gregor, 6,038,791, Cl. 36-115.000.

Miura, Haruo: *See*—
Kobayashi, Hiromi; Nishida, Hideo; Miura, Haruo; Eino, Takashi; and Takahashi, Kazuki, 6,039,535, Cl. 415-172.100.

Miura, Kenju: *See*—
Saitoh, Masayuki; Kitajima, Yasuo; Iwasawa, Norio; Miura, Kenju; Haruyama, Munetada; and Hashino, Junko, 6,040,335, Cl. 514-460.000.

Miura, Kouji: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.

Miura, Masato: *See*—
Shiina, Kazuhiro; Kawamoto, Koji; Miura, Masato; Ohura, Hitoshi; Ozeki, Shoichi; Akiyama, Noboru; Nunomura, Kunihoro; Nemoto, Minehiro; and Iwamura, Masahiro, 6,040,827, Cl. 345-208.000.

Miura, Takahito: *See*—
Hayafune, Takeshi; Maemura, Kouichiro; and Miura, Takahito, 6,041,183, Cl. 395-712.000.

Miura, Takamitsu: *See*—
Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, 6,040,520, Cl. 136-245.000.

Miwa, Makoto: *See*—
Morikawa, Junya; and Miwa, Makoto, 6,039,032, Cl. 123-520.000.

Miwa, Minoru; Takeno, Akiyoshi; Koike, Toshihiro; Ako, Satoshi; and Sugiyama, Yasunori, to Kimoto Co., Ltd. Reflection screen and method for producing the same. 6,040,941, Cl. 359-443.000.

Miya, Shinya; and Kanayama, Satoshi, to Mitsubishi Engineering-Plastics Corporation. Polycarbonate resin composition. 6,040,367, Cl. 524-107.000.

Miyabayashi, Toshiyuki: *See*—
Kubota, Kazuhide; and Miyabayashi, Toshiyuki, 6,039,796, Cl. 106-31.600.

Miyakawa, Hisashi: *See*—
Michiki, Hideyuki; Miyakawa, Hisashi; and Ohsaki, Kozo, 6,041,272, Cl. 700-266.000.

Miyake, Shoji; Inaba, Toru; and Koda, Eiji, to Fujitsu Limited. Call control system for a subscriber transmission device. 6,041,052, Cl. 370-360.000.

Miyamoto, Takaaki, to Sony Corporation. Plasma CVD process for metal films and metal nitride films. 6,040,021, Cl. 427-576.000.

Miyamoto, Tetsuya; and Kawata, Masakazu, to Sumitomo Bakelite Co., Ltd. Anisotropic conductive adhesive and method for preparation thereof and an electronic apparatus using said adhesive. 6,039,896, Cl. 252-511.000.

Miyamoto, Yasuo; and Takata, Hidekazu, to Sharp Kabushiki Kaisha. Semiconductor type memory device having consecutive access to arbitrary memory address. 6,041,015, Cl. 365-236.000.

Miyano, Sotaro; Hattori, Tetsutaro; Uesugi, Osamu; Tamai, Yasufumi; and Sayo, Noboru, to Takasago International Corporation. Process for producing optically active β-lactones. 6,040,465, Cl. 549-510.000.

Miyasaka, Matsuho: *See*—
Kuroda, Tetsuo; Miyasaka, Matsuho; and Takahashi, Norio, 6,038,882, Cl. 62-476.000.

Miyasaka, Yoshio, to Fuji Kihan Co., Ltd. Method for a surface treatment of metallic product. 6,038,900, Cl. 72-53.000.

Miyawaki, Yoshitaka: *See*—
Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.

Miyazaki, Akimitsu; Ibukuro, Sadao; and Nagakubo, Yasunori, to Fujitsu Limited. Optical transmitter, terminal-station apparatus having the optical transmitter, and optical communication system. 6,040,931, Cl. 359-110.000.

Miyazaki, Satoshi: *See*—
Hirata, Toshiaki; Urano, Akihiro; Fujino, Shuji; Yamada, Mitsugu; Nakano, Hidetomo; Morita, Shinji; and Miyazaki, Satoshi, 6,041,353, Cl. 709-224.000.
Sugauchi, Kiminori; Hirata, Toshiaki; Nishiki, Kenya; Miyazaki, Satoshi; Mizuguchi, Keizo; and Fujino, Shuji, 6,041,349, Cl. 709-223.000.

Miyazaki, Tadakazu: *See*—
Kinsho, Toshihiko; Satake, Munekazu; and Miyazaki, Tadakazu, 6,040,398, Cl. 525-527.000.

Miyazawa, Satoshi: *See*—
Yeol, Oh Eui; Mitsumori, Kenichi; and Miyazawa, Satoshi, 6,039,815, Cl. 134-2.000.

Miyoshi, Kei: *See*—
Fujiki, Hironao; Miyoshi, Kei; and Muramatsu, Hironobu, 6,040,361, Cl. 523-209.000.

Miyoshi, Kunio: *See*—
Tanaka, Junichi; Miyoshi, Kunio; and Yamashita, Sensuke, 6,039,723, Cl. 604-532.000.

Mizoguchi, Naoyuki; Yamamoto, Katsuyuki; and Wada, Kimihito, to Matsutani Chemical Industries Co., Ltd. Bread and bread's dough. 6,039,997, Cl. 426-549.000.

Mizoguchi, Tadashi: *See*—
Hagiwara, Yoshihiro; Suetsugu, Junichi; Mizoguchi, Tadashi; Minemoto, Hitoshi; Takemoto, Hitoshi; Shima, Kazuo; and Yakushiji, Toru, 6,039,442, Cl. 347-89.000.

Mizuguchi, Keizo: *See*—
Sugauchi, Kiminori; Hirata, Toshiaki; Nishiki, Kenya; Miyazaki, Satoshi; Mizuguchi, Keizo; and Fujino, Shuji, 6,041,349, Cl. 709-223.000.

Mizuno, Yuhei; Kawamura, Yoshihiro; and Kondo, Shiro, to Nicca Chemical Co., Ltd. Cleaning process for dry cleaning. 6,039,766, Cl. 8-142.000.

Mizunoya, Nobuyuki: *See*—
Ikeda, Kazuo; Komorita, Hiroshi; Sato, Yoshitoshi; Komatsu, Michiyasu; and Mizunoya, Nobuyuki, 6,040,039, Cl. 428-210.000.

Mizunuma, Koji: *See*—
Nitta, Satoru; and Mizunuma, Koji, 6,039,904, Cl. 264-40.500.

Mizushima, Takashi: *See*—
Okita, Tomoaki; Nakashima, Katsumi; Mizushima, Takashi; and Wadaki, Takeru, 6,040,351, Cl. 521-140.000.

Mizutani, Noriyuki: *See*—
Takahashi, Sakon; Takagi, Shinpei; Mizutani, Noriyuki; Oya, Yasuhiro; and Ishida, Haruhide, 6,040,102, Cl. 430-108.000.

MMC Networks, Inc.: *See*—
Joffe, Alexander; and Birger, Ari, 6,041,059, Cl. 370-412.000.

Mo, Jiancheng: *See*—
Chen, Feng; Kolagotla, Ravi K.; Ly, Le T.; Mo, Jiancheng; and Srinivas, Hosahalli R., 6,041,418, Cl. 713-400.000.

Mo Och Domsjö Aktiebolag: *See*—
Brännland, Rolf C. A.; and Noréus, Sture E. O., 6,039,837, Cl. 162-29.000.

Mobil Oil Corporation: *See*—
Mueller, Manfred W., 6,039,117, Cl. 166-312.000.

Mobin, Mohammed S.: *See*—
Baker, Thomas W.; and Mobin, Mohammed S., 6,041,086, Cl. 375-341.000.

Mobley, Larry W.: *See*—
Jennings, James K.; Jenkines, Randall C.; and Mobley, Larry W., 6,040,381, Cl. 524-871.000.

Moceanu, John Ion: *See*—
Haag, Ronald Helmut; Orr, Brian Norman; and Moceanu, John Ion, 6,038,818, Cl. 49-360.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Yamamoto, Ichiro; Itoh, Manabu; Shimojo, Masato; Yumiya, Yasunobu; Mukaihira, Takafumi; and Akada, Yasushige, 6,040,331, Cl. 514-411.000.

Mochizuki, Hirotake: *See*—
Makino, Masanori; Mochizuki, Hirotake; Misawa, Takao; and Tsuda, Takao, 6,040,891, Cl. 355-46.000.

Mockenhaupt, Martin; and Szott, Michael J., to Fel-Pro Incorporated. Rubber molded gasket with compression limiter. 6,039,323, Cl. 277-593.000.

Modine Manufacturing Company: *See*—
Kalbacher, Klaus; Schuttarle, Karl; Temmesfeld, Axel; and Eckerskorn, Winfried, 6,039,263, Cl. 236-93.00A.

Modlin, Douglas N.: *See*—
Winkler, James L.; Fodor, Stephen P. A.; Buchko, Christopher J.; Ross, Debra A.; Aldwin, Lois; and Modlin, Douglas N., 6,040,193, Cl. 436-180.000.

Moenning, Stephen P.; and Manker, Charles. Apparatus and method for securing a medical instrument to a cannula of a trocar assembly. 6,039,725, Cl. 606-1.000.

Mohammadi, Fatemeh, to Elizabeth Arden Company, Division of Conopco, Inc. Sunscreen compositions. 6,039,935, Cl. 424-59.000.

Mohammed, Mannan, to Intel Corporation. Method and apparatus for detecting network traffic and initiating a dial-up connection using separate upstream and downstream devices. 6,041,356, Cl. 709-227.000.

Mohr, Gary David; and Verduijn, Johannes Petrus, to Exxon Chemical Patents Inc. Hydrocarbon conversion process using a zeolite bound zeolite catalyst. 6,039,864, Cl. 208-134.000.

Mohr, Gary David; and Verduijn, Johannes Petrus, to Exxon Chemical Patents Inc. Metal-containing zeolite catalyst, preparation thereof and use for hydrocarbon conversion. 6,040,259, Cl. 502-67.000.

Moles, Peter: *See*—
Wilkins, Robert Lee; and Moles, Peter, 6,039,120, Cl. 166-368.000.

Molex Incorporated: *See*—
Etters, Harry N.; Fuerst, Robert M.; and Watt, Russell J., 6,039,600, Cl. 439-496.000.
Kunishi, Shinsuke, 6,039,590, Cl. 439-247.000.

Moll, Reiner; Fedderke, Helge; and Hartmann, Christoph, to Jungjohann, Thomas. Braking means for a movable part of a furniture component, especially an upholstered furniture component. 6,039,154, Cl. 188-67.000.

Molnar, Karl: *See*—
Raith, Alex K.; Ramesh, Rajaram; Molnar, Karl; Koilpillai, R. David; and Koorapaty, Havish, 6,040,800, Cl. 342-387.000.

Molnlycke Health Care AB: *See*—
Lindquist, Bengt W.; and Fabo, Tomas, 6,040,492, Cl. 602-41.000.

Momose, Mitsuru, to Mitsubishi Shindoh Co., Ltd. Film condenser and metalized film. 6,040,038, Cl. 428-209.000.

Monden, Noriko: *See*—
Arimori, Susumu; Seko, Masahiro; Tanaka, Masakazu; Monden, Noriko; and Yokota, Hideyuki, 6,040,415, Cl. 528-71.000.

Monette, Dave R.; and Kirk, Randall D., to Chrysler Corporation. Stabilization system for liftgate. 6,039,389, Cl. 296-207.000.

Monfort, Inc.: *See*—
Bowling, Rod A.; and Clayton, Robert Paul, 6,039,984, Cl. 426-61.000.

Monia, Brett P.; and Cowsert, Lex M., to Isis Pharmaceuticals Inc. Antisense inhibition of Smad5 expression. 6,040,178, Cl. 435-375.000.

Monk, David T.; Hill, Joe T.; Wagner, Phillip C.; Loprete, Joseph F.; and Young, Michael R., to Bristol Compressors, Inc. Variable capacity compressor having two-step motor strength adjustability. 6,040,679, Cl. 318-778.000.

Monks, Colin R. F.: *See*—
Kupfer, Abraham; Kupfer, Hannah; and Monks, Colin R. F., 6,040,152, Cl. 435-29.000.

Monoi, Takashi; Yamamoto, Masakazu; Torigoe, Hidenobu; and Takemoto, Yasunori, to Japan Polyolefins Co., Ltd. Preparation method of ethylene base polymer. 6,040,399, Cl. 526-106.000.

Monroe, John W.; Smith, John J.; Kenyon, Stephen C.; and Anderson, Michael E., to Sparta, Inc. System for transmission and recovery of digital data using video graphics display processor and method of operation thereof. 6,040,843, Cl. 345-507.000.

Monsanto Company: *See*—
Johnson, Todd J.; and Miller, William H., 6,040,476, Cl. 562-1.000.
Riego, Domingo C.; Cox, Kenneth C.; Sexton, Franklin E.; and Meadows, James C., 6,040,272, Cl. 504-206.000.

Monsanto Corporation: *See*—
Moots, Craig K., 6,040,499, Cl. 800-312.000.

Monster Cable Products, Inc.: *See*—
Marsh, Richard N.; and Martin, Demian T., 6,039,591, Cl. 439-265.000.

Monte, Thomas D., to KVH Industries, Inc. Grooved optical fiber for use with an electrode and a method for making same. 6,041,149, Cl. 385-2.000.

Monte, Woodrow C. Laminated baked product and method of making the same. 6,039,988, Cl. 426-94.000.

Moon, Seung Kee: *See*—
Hong, Chung, Il; Kim, Jung Woo; Lee, Sang Joon; Ahn, Soon Kil; Choi, Nam Song; Hong, Ryung Kee; Chun, Hyoung Sik; Moon, Seung Kee; and Lee, Hong Woo, 6,040,337, Cl. 514-475.000.

Moore, James: *See*—
Gunn, Brian Leslie; Moore, James; and Hancocks, Michael Turley, 6,039,090, Cl. 141-17.000.

Moore, Jeremy W.: *See*—
Caravella, James S.; Mietus, David F.; and Moore, Jeremy W., 6,041,221, Cl. 455-186.100.

Moore North America, Inc.: *See*—
Kendrick, Jimmy Ray, 6,039,357, Cl. 283-93.000.

Moore, Richard L.; Robson, Michael G.; Lockeby, Warren E., Jr.; and Kaylor, Billy E., to Lerio Corporation, The. Method and apparatus for controlling root growth. 6,038,813, Cl. 47-75.000.

Moore, Stephen Raymond: *See*—
Cain, Frederick William; Quinlan, Paul Thomas; and Moore, Stephen Raymond, 6,040,161, Cl. 435-134.000.

Moore U.S.A. Inc.: *See*—
Tee, M. Richard, 6,039,242, Cl. 229-92.100.

Moote, Richard K.: *See*—
Kennie, Jerry; Cheng, Yi; Hope, Mark E.; Huff, Shean; Nankee, Robert J., II; Joyce, Mary; Krozek, Dennis A.; Moote, Richard K.; Richardson, Roland T.; Rotramel, William D.; and Seitz, Gary L., 6,041,278, Cl. 701-103.000.

Moots, Craig K., to Monsanto Corporation. Soybean cultivar 943347632294. 6,040,499, Cl. 800-312.000.

Moran, Robert James: *See*—
Field, Martin John; Ballmert, Bernd Jakob; Collins, Laurence Alexander; and Moran, Robert James, 6,039,034, Cl. 123-568.230.

Morando, Jorge A. Jet column reactor pump with coaxial and/or lateral intake opening. 6,039,917, Cl. 266-217.000.

Morataya, Carmen, to Intevep, S.A. Method for dehydrating a waste hydrocarbon sludge. 6,039,880, Cl. 210-708.000.

Morawietz, Markus: *See*—
Riedel, Michael; Weller, Thomas; Jacobs, Alexandra; Herrmann, Wolfgang Anton; and Morawietz, Markus, 6,040,469, Cl. 556-53.000.

Morelli, Marco: *See*—
Milanesi, Andrea; Poletto, Vanni; Poma, Alberto; and Morelli, Marco, 6,040,736, Cl. 327-541.000.

Moretti, Sonia, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.; and Mendes s.r.l. Use of L-carnitine and derivatives for reducing ceramide levels and potentiating antiretroviral drugs. 6,040,346, Cl. 514-642.000.

Morgan, Allan Clark: *See*—
Mabry, Melinda Ann; Rumpf, Frederick Harry; Podobnik, Ivan Zlatko; Westveer, Scott Adrian; Morgan, Allan Clark; Chung, Bin; and Andrews, Malcolm John, 6,040,364, Cl. 523-318.000.

Morghen, Manfred A. Workpiece clamping system. 6,039,312, Cl. 269-47.000.

Mori, Kenichi; Ito, Katsuya; Kotani, Tooru; Suzuki, Toshitake; and Sasaki, Yasushi, to Toyo Boseki Kabushiki Kaisha. Recording material. 6,039,444, Cl. 347-105.000.

Mori, Takeshi: *See*—
Toyoda, Yoshihiko; Fukada, Tetsuo; Mori, Takeshi; and Hasegawa, Makiko, 6,039,808, Cl. 118-715.000.

Mori, Yoshikuni: *See*—
Naka, Akio; Yamamoto, Tetsuya; and Mori, Yoshikuni, 6,040,101, Cl. 430-108.000.

Morikami, Masashi: *See*—
Masuda, Fumitoshi; and Morikami, Masashi, 6,040,757, Cl. 338-160.000.

Morikawa, Junya; and Miwa, Makoto, to Denso Corporation. Air-fuel ratio controller for an internal combustion engine. 6,039,032, Cl. 123-520.000.

Morikawa, Kiyoshi: *See*—
Ishida, Nobuo; Togashi, Jun; Kimura, Tomomichi; Morikawa, Kiyoshi; Nakayama, Yoshihumi; Akiyama, Hiroshi; Yanagisawa, Tatsuya; and Ota, Takashi, 6,041,032, Cl. 369-191.000.

Morikawa, Takeshi, to Minolta Co., Ltd. Image forming apparatus capable of forming an image at a plurality of resolutions. 6,041,165, Cl. 395-102.000.

Morimoto, Koichi: *See*—
Sageser, David Mark; Shirakawa, Takuya; and Morimoto, Koichi, 6,039,906, Cl. 264-156.000.

Morishita, Hideki: *See*—
Ueda, Makoto; Shiga, Shigenori; Tajima, Satoko; and Morishita, Hideki, 6,041,091, Cl. 376-327.000.

Morishita, Jun-ichi: *See*—
Wu, Shang-Qian; Morishita, Jun-ichi; Ishihara, Yoshio; and Kimijima, Tetsuya, 6,040,915, Cl. 356-435.000.

Morishita, Yasuo: *See*—
Takehara, Nobuyuki; Shimoda, Kazuhisa; and Morishita, Yasuo, 6,038,771, Cl. 29-897.200.

Morisige, Takayuki: *See*—
Takamori, Hiroki; and Morisige, Takayuki, 6,041,067, Cl. 370-514.000.

Morita, Keizo: *See*—
Murakami, Hiroshi; Yoshioka, Koji; Morita, Keizo; Itokazu, Masafumi; Nakabayashi, Ken-ichi; Yamamoto, Akira; and Haraguchi, Munehiro, 6,040,814, Cl. 345-94.000.

Morita, Naotoshi; and Wakita, Sachio, to NGK Spark Plug Co., Ltd. Ozonizer, water purifier and method of cleaning an ozonizer. 6,039,816, Cl. 134-19.000.

Morita, Shinji: *See*—
Hirata, Toshiaki; Urano, Akihiro; Fujino, Shuji; Yamada, Mitsugu; Nakano, Hidetomo; Morita, Shinji; and Miyazaki, Satoshi, 6,041,353, Cl. 709-224.000.

Moriyama, Junichi: *See*—
Meki, Seiji; Yamada, Shunji; and Moriyama, Junichi, 6,041,066, Cl. 370-512.000.

Morokoshi, Hiroshi: *See*—
Ohmi, Tadahiro; Yamaji, Michio; Shinohara, Tsutomu; Itoi, Shigeru; Hirao, Keiji; Kawano, Yuji; Tanaka, Shigeaki; Yokoyama, Kosuke; Morokoshi, Hiroshi; and Ikeda, Nobukazu, 6,039,360, Cl. 285-61.000.

Moroney, Nathan, to Hewlett-Packard Company. Thresholded undercolor removal and black replacement in a thermal-inkjet printer or plotter. 6,039,434, Cl. 347-43.000.

Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, to Semicondutor Energy Laboratory Co., Ltd.; and TDK Corporation. Solar cell and method of manufacturing the same. 6,040,520, Cl. 136-245.000.

Morov, Georgiy: *See*—
Shturman, Leonid; Morov, Georgiy; and Malgichev, Vladimir, 6,039,747, Cl. 606-159.000.

Morris, Mary L.: *See*—
Ho, Kwok-Lun; Follensbee, Robert A.; Harmer, Walter L.; and Morris, Mary L., 6,039,775, Cl. 51-295.000.

Morris, Nicholas Andrew: *See*—
Birch, Brian Jeffrey; and Morris, Nicholas Andrew, 6,039,861, Cl. 205-335.000.

Mortensen, Dave: *See*—
Forbes, David R.; Mortensen, Dave; Bean, Ron M; and Williams, Gregory G., 6,039,627, Cl. 446-208.000.

Mosel Vitelic, Inc.: *See*—
Sung, Kuo-Tung, 6,040,216, Cl. 438-257.000.

Moser, Gregory C.: *See*—
Bedja, Abdelkrim; Moser, Gregory C.; and King, Raymond P., 6,039,149, Cl. 182-20.000.

Mosesian, Jerry L.: *See*—

Martenson, Kenneth R.; Mosesian, Jerry L.; Wilkinson, Alan F.; and Goldbach, William, 6,040,971, Cl. 361-118.000.
Moslehi, Mehrdad M.: Davis, Cecil J.; and Heimanson, Dorian, to CVC Products, Inc. Ultra-high vacuum apparatus and method for high productivity physical vapor deposition.. 6,039,848, Cl. 204-192.120.
Moss, Bernard: *See*—
Earl, Patricia L.; Broder, Christopher C.; Doms, Robert W.; and Moss, Bernard, 6,039,957, Cl. 424-208.100.
Motizuki, Kunihiro: *See*—
Konosu, Koji; Sugiura, Akio; and Motizuki, Kunihiro, 6,039,256, Cl. 235-462.430.
Motoe, Katsuro: *See*—
Hara, Yoshikazu; Motoe, Katsuro; and Sanagi, Hisashi, 6,038,968, Cl. 101-116.000.
Motonami, Kaoru: *See*—
Kitaguchi, Akira; Hatakenaka, Makoto; Nakajima, Michio; Motonami, Kaoru; Shiroshima, Kiyoyuki; and Yamashita, Takekazu, 6,040,614, Cl. 257-529.000.
Motooka, Eiji, to Noritsu Koki Co., Ltd. Method of printing photosensitive material. 6,040,896, Cl. 355-72.000.
Motorola: *See*—
Murray, Bradley A., 6,040,781, Cl. 340-825.220.
Motorola, Inc.: *See*—
Alterman, Steven S.; Sanchez, Mauricio E.; and Longhurst, Audrey, 6,041,045, Cl. 370-313.000.
Amero, Willard F., Jr.; and Herrmann, John E., 6,039,608, Cl. 439-651.000.
Caravella, James S.; Mietus, David F.; and Moore, Jeremy W., 6,041,221, Cl. 455-186.100.
Chambers, Benjamin C.; Blood, William R., Jr.; and Lee, Tien-Yu T., 6,040,624, Cl. 257-692.000.
Erickson, Paul M.; and Spets, Timothy J., 6,041,048, Cl. 370-349.000.
Geis, David G.; Doikas, Peter; and Demonaco, Jeffrey, 6,039,582, Cl. 439-76.100.
Kosiec, Jeannie Han, 6,040,720, Cl. 327-83.000.
Lauvray, Olivier J.; and Rodriguez, David, 6,040,604, Cl. 257-355.000.
Mangat, Pawitter Jit Singh; Seese, Philip Armin; and Dauksher, William Joseph, 6,039,835, Cl. 156-345.000.
Mottier, Matthew D., 6,040,683, Cl. 320-137.000.
Paulson, Jeffrey R.; and Fonda, Arturo, 6,039,849, Cl. 204-192.120.
Reed, John Douglas; and Smith, Jack Anthony, 6,041,239, Cl. 455-453.000.
Roeckner, William, 6,041,007, Cl. 365-225.700.
Sanchez, Hector; Alvarez, Jose M.; Siegel, Joshua; and Nicoletta, Carmine, 6,040,729, Cl. 327-309.000.
Skoro, John P., III; Bunkenburg, Brian K.; and Shaughnessy, Mark L., 6,041,226, Cl. 455-405.000.
Stanton, Stephen Millard; Davis, James Talmage, II; Dutson, Alan James; and Henderson, Gregory Lane, 6,040,846, Cl. 345-905.000.
Sumner, Terence Edward, 6,041,227, Cl. 455-412.000.
Trissel, David Wesley, 6,039,765, Cl. 703-26.000.
Vega, Victor Allen; and Eberhardt, Noel H., 6,040,773, Cl. 340-572.100.
Willey, William Daniel, 6,041,241, Cl. 455-574.000.
Motose, Hitoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust timing valve control for watercraft engine. 6,039,013, Cl. 123-65.0PE.
Motoyama, Yu, to Yamaha Hatsudoki Kabushiki Kaisha. Operating control system for 2 cycle direct injection engine. 6,039,012, Cl. 123-65.0PE.
Mottier, Matthew D., to Motorola, Inc. Battery charger with active feedback voltage controller. 6,040,683, Cl. 320-137.000.
Motyka, Andrea Lee; Broaze, Guy; and Kugler, Alison, to Colgate-Palmolive Co. Laundry concentrates. 6,040,071, Cl. 428-704.000.
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Krumm, Helmut; Kittel, Florenz; Koette, Rolf; and Motzheim, Ralf, 6,039,907, Cl. 264-161.000.
Moulthrop, Andrew Alfred: *See*—
Clark, Christopher Joseph; Moulthrop, Andrew Alfred; Muha, Michael Steven; and Silva, Christopher Patrick, 6,041,077, Cl. 375-224.000.
Moulton, Russell D.: *See*—
Cheu, S. Scot; and Moulton, Russell D., 6,040,085, Cl. 429-185.000.
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Bancroft, Frank Carter; and Fliss, Makiko, 6,040,144, Cl. 435-6.000.
Pogo, Beatriz; and Holland, James, 6,040,146, Cl. 435-7.230.
Moutet, Marc: *See*—
Tailhan-Lomont, Catherine; Erdelmeier, Irène; Moutet, Marc; Chaudiere, Jean; and Yadan, Jean-Claude, 6,040,328, Cl. 514-398.000.
Moyer, Thomas P.: *See*—
Long, David C.; Moyer, Thomas P.; O'Neil, Keith C.; Perry, Charles H.; Pomerantz, Glenn A.; Case, James R.; Kando, Laszlo; and Kozol, John E., 6,038,931, Cl. 73-850.000.
Moyle, Matthew: *See*—
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Marsic, Martin D., 6,039,162, Cl. 192-108.000.
MTD Products Inc.: *See*—
Ciavarella, Nicholas, 6,039,598, Cl. 439-451.000.
MTI Corporation: *See*—
Liu, Jiancheng; and Yamazaki, Kazuo, 6,040,584, Cl. 250-559.110.
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Meyer, Richard A., 6,038,933, Cl. 73-862.045.
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Mueller, Manfred W., to Mobil Oil Corporation. Downhole wash tool. 6,039,117, Cl. 166-312.000.
Mufti, Naheed: *See*—
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Muha, Michael Steven: *See*—
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Hübner, Heijo; Lübbers, Dierk; and Mühlbauer, Wolfgang, 6,040,354, Cl. 523-109.000.
Muhlhoff, Olivier, to Compagnie Generale des Etablisse-Michelin-Michelin & Cie. Safety insert with warning function. 6,039,099, Cl. 152-158.000.
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Mukojima, Masahiro; and Kamiya, Ryo, to Yamaha Corporation. Method and device for generating a tone. 6,040,515, Cl. 84-603.000.
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Kraiczyk, Josef; and Mulders, Stephanus, 6,039,601, Cl. 439-500.000.
Muliadiredja, Achmad R.: *See*—
Kennelly, Kevin; Gardiner, Ian; Noble, David; and Muliadiredja, Achmad R., 6,039,507, Cl. 405-227.000.
Müller, Anton, to Eisen - und Drahtwerk Erlau Aktiengesellschaft. Stay member for tire chains, especially for protective tire chains. 6,039,100, Cl. 152-243.000.
Muller, Gerhard: *See*—
Berlien, Hans-Peter; Muller, Gerhard; Beuthan, Jürgen; and Philipp, Carsten, 6,039,728, Cl. 606-15.000.
Muller, Harry; and Mathes, Joachim, to ITT Manufacturing Enterprises, Inc. Overpaintable bumper with ultrasound transducer. 6,039,367, Cl. 293-117.000.
Müller, Heinz: *See*—
Hegner, Frank; Schmidt, Elke Maria; Güther, Volker; Otto, Andreas; Breme, Jürgen; Müller, Heinz; and Turnsek, Jürgen Peter, 6,039,918, Cl. 420-422.000.
Müller, Hubert; and Svejkovsky, Ulrich, to SMS Schloemann-Siemag Aktiengesellschaft. Method of operating a roll stand arrangement. 6,038,757, Cl. 29-527.700.
Müller, Klaus-Helmut: *See*—
Thielert, Wolfgang; Bohne, Gerhard; and Müller, Klaus-Helmut, 6,040,271, Cl. 504-134.000.
Mullis, Kary B.: *See*—
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; Mullis, Kary B.; and Gelfand, David H., 6,040,166, Cl. 435-194.000.
Multilift Oy: *See*—
Mylläri, Esa, 6,039,527, Cl. 414-491.000.
Multisorb Technologies, Inc.: *See*—
Murray, Patrick M., 6,038,881, Cl. 62-474.000.
Mumm, Rita: *See*—
Spencer, Michael; Mumm, Rita; and Gwyn, Jeff, 6,040,497, Cl. 800-288.000.
Mumper, Russell J.: *See*—
Rolland, Alain; and Mumper, Russell J., 6,040,295, Cl. 514-44.000.
Munch, Carl A., to TRW Inc. Vehicle occupant weight sensor. 6,040,532, Cl. 177-144.000.
Münch, Ulrich; Jaeggi, Dominik; and Schneeberger, Niklaus, to EM Microelectronic-Marin SA. Thermoelectric sensor. 6,040,579, Cl. 250-344.000.
Münker, Jochen: *See*—
Hartung, Hans-Georg; Münker, Jochen; and Richter, Hans-Peter, 6,038,906, Cl. 72-241.800.
Munneke, Christiaan Antoon: *See*—
de Haan, Hendrik Andries; and Munneke, Christiaan Antoon, 6,038,835, Cl. 53-460.000.
Munnich, Arnold: *See*—
Melki, Judith; and Munnich, Arnold, 6,040,142, Cl. 435-6.000.
Munoz, Jorge: *See*—
Cheah, Chuan; Munoz, Jorge; and Kinzer, Dan, 6,040,626, Cl. 257-735.000.
Munoz-Baca, Julio Manuel; Bäumer, Klaus; and Bald, Erhard, to Hylsa S.A. de C.V.; and SMS Schloemann-Siemag Aktiengesellschaft. Thin strip coiling system. 6,039,283, Cl. 242-534.000.

Murakami, Eiji: *See*—
Kimura, Kenichi; Shiga, Akira; Hashiguchi, Toshihiko; Murakami, Eiji; and Sasaki, Katsumi, 6,039,752, Cl. 606-205.000.

Murakami, Hiroshi; Yoshioka, Koji; Morita, Keizo; Itokazu, Masafumi; Nakabayashi, Ken-ichi; Yamamoto, Akira; and Haraguchi, Munehiro, to Fujitsu Limited. Active-matrix liquid crystal display and method of driving same. 6,040,814, Cl. 345-94.000.

Murakami, Katsumi: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

Murali, Dhanabalan: *See*—
Hausheer, Fredrick H.; Murali, Dhanabalan; and Seetharamulu, Peddaiahgari, 6,040,330, Cl. 514-408.000.

Muramatsu, Hironobu: *See*—
Fujiki, Hironao; Miyoshi, Kei; and Muramatsu, Hironobu, 6,040,361, Cl. 523-209.000.

Murata, Jun, to Canon Kabushiki Kaisha. Charging member having an elastomeric member including an elastomeric material having a double oxide. 6,041,209, Cl. 399-313.000.

Murata, Kousaku: *See*—
Ogura, Takashi; and Murata, Kousaku, 6,039,145, Cl. 181-167.000.

Murata Manufacturing Co., Ltd.: *See*—
Abe, Yoshiaki; and Hirota, Toshiharu, 6,040,755, Cl. 338-22.00R.
Kaida, Hiroaki, 6,040,652, Cl. 310-320.000.
Kushihi, Yuichi; and Shikata, Masaru, 6,040,806, Cl. 343-853.000.
Masuda, Fumitoshi; and Morikami, Masashi, 6,040,757, Cl. 338-160.000.
Sekijima, Takenori; Fujii, Takashi; Wakino, Kikuo; and Okada, Masakatsu, 6,039,802, Cl. 117-49.000.
Takeuchi, Haruyuki, 6,040,972, Cl. 361-119.000.
Tanaka, Hiroaki; Sasaki, Yutaka; and Hashimoto, Takuya, 6,040,745, Cl. 333-26.000.

Murata, Masanao: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.

Murata, Shizuo: *See*—
Sawada, Shinichi; Murata, Shizuo; and Isoyama, Toyoshiro, 6,040,890, Cl. 349-182.000.

Murata, Toshinori: *See*—
Bando, Yumi; Okamura, Takumi; and Murata, Toshinori, 6,040,867, Cl. 348-423.000.

Murdock, Thomas O.: *See*—
Venkatraman, Subramanian S.; Murdock, Thomas O.; and Pudjijanto, Stephanus, 6,039,977, Cl. 424-486.000.

Murphy, Edward J.; Classey, Jeffrey; and Szum, David M., to DSM N.V. Method of making a radiation-curable ink composition, radiation-curable ink composition and ribbon assembly. 6,040,357, Cl. 523-160.000.

Murphy, James L.: *See*—
Ringel, Cary J.; and Murphy, James L., 6,039,151, Cl. 187-207.000.

Murphy, Mike: *See*—
Ng, Tony; and Murphy, Mike, 6,039,460, Cl. 362-267.000.

Murphy, Oliver J.; Salinas, Carlos; and Cisar, Alan J., to Lynntech, Inc. Apparatus and method for compressing a stack of electrochemical cells. 6,040,072, Cl. 429-12.000.

Murray, Bradley A., to Motorola. Event reminder for a communication device. 6,040,781, Cl. 340-825.220.

Murray, Inc.: *See*—
Bates, Ray G., Jr.; Deweese, Robert M., Jr.; and Burns, John A., 6,038,841, Cl. 56-15.800.

Murray, Patrick M., to Multisorb Technologies, Inc. Adsorbent unit for air conditioning system. 6,038,881, Cl. 62-474.000.

Murthy, Ashok: *See*—
Komplin, Steven Robert; Murthy, Ashok; and Sullivan, Carl Edmond, 6,039,439, Cl. 347-65.000.

Murty, Balarama Vempaty, to General Motors Corporation. High voltage bus and auxiliary heater control system for an electric or hybrid vehicle. 6,040,561, Cl. 219-494.000.

Muscara, Dominic. Conveyor drive and control system. 6,039,092, Cl. 141-129.000.

Muscat, Armond. Process and apparatus for the treatment of waste. 6,039,504, Cl. 405-129.000.

Muschik, Peter: *See*—
Krause, Werner; Maier, Franz-Karl; Bauer, Michael; Schuhmann Giampieri, Gabriele; Press, Wolf-Rudiger; and Muschik, Peter, 6,040,432, Cl. 534-16.000.

Muser, Paul, to Supima Holdings Inc. Bicycle seat and seat cover. 6,039,396, Cl. 297-214.000.

Musgrove, Rupert Jeremy: *See*—
Bickerton, Matthew John; Bohrer, Kathryn Ann; Hughes, Emma Suzanne; Kenworthy, Edward William; Musgrove, Rupert Jeremy; Patterson, LindaMay Rose; Porter, Steven; Salt, David Dennis; and Scattergood, Duncan Keith, 6,041,312, Cl. 705-30.000.

Mushabac, David R.; and Policht, Stanislaw A., to Dentrac Corp. Remote sensor apparatus and method. 6,038,780, Cl. 33-512.000.

Mussmann, Lothar; Chauvin, Yves; and Olivier, Helene, to Institut Francais du Petrole. Catalytic composition based on transition metal complexes, and a process for the hydrogenation of unsaturated compounds. 6,040,263, Cl. 502-164.000.

Musy, Jean-Pierre: *See*—
Tu, Mai Xuan; Schwab, Michel; and Musy, Jean-Pierre, 6,041,022, Cl. 368-64.000.

Mutoh Industries Ltd.: *See*—
Yamada, Yoshikuni; Nozawa, Shinya; and Yamada, Yutaka, 6,038,776, Cl. 33-18.100.

Muttin, Frédéric: *See*—
Laporte, Jean-Jacques; Tassily, Eric; and Muttin, Frédéric, 6,039,349, Cl. 280-748.000.

MWM Distributors: *See*—
Meli, Oswald P. J., 6,039,361, Cl. 285-148.190.

Myers, Charles; Trepel, Jane; Kang, Won Ki; Whitesell, Luke; and Neckers, Len, to United States of America, Health and Human Services. Use of inhibitors of 3-hydroxy-3-methylglutaryl coenzyme a reductase as a modality in cancer therapy. 6,040,334, Cl. 514-460.000.

Myers, Ken L.: *See*—
L'Allier, James J.; Welsh, Sally H.; Nielsen, Boyd W.; Miles, Kurt W.; Myers, Ken L.; Henrie, Stephen P.; Norberg, Michael I.; and Hellwell, Laura I., 6,039,575, Cl. 434-323.000.

Myers, Loren D., to Loudon Enterprises, Inc. Rock drill. 6,039,127, Cl. 175-57.000.

Mylchreest, Donald G.: *See*—
Anderson, David K.; Chiu, John H.; McNary, Steven F.; Phyfe, Nicole M.; Turek, David G.; and Mylchreest, Donald G., 6,039,008, Cl. 122-510.000.

Mylläri, Esa, to Multilift Oy. Container combination and a mehtod of handling containers. 6,039,527, Cl. 414-491.000.

N. E. Medical Center Hospitals: *See*—
Durville, Frederick M.; Connolly, Raymond J; Lantis, John C; Rediker, Robert H; and Schwaitzberg, Steven D., 6,039,729, Cl. 606-16.000.

Nabahi, Shohre, to Hoechst Marion Roussel. Intravaginal drug delivery device. 6,039,968, Cl. 424-433.000.

Nabors, William; Yates, Debra S.; Linnebur, David H.; Rodriguez, Jon; and Hill, Andrew, to Coleman Company, Inc., The. Foldable tool with removable tool cartridged mechanism for securing tool cartridge. 6,038,723, Cl. 7-128.000.

Nadherny, Rudolph E., to Ireco, Inc. Cam-operated single acting hatch cover lock. 6,039,362, Cl. 292-197.000.

Nadkarni, Anil V.: *See*—
Dalal, Kirit; Köhler, Ekkehard; and Nadkarni, Anil V., 6,039,785, Cl. 75-235.000.

Näff, Dominik; and Lörenz, René, to Etablissement Supervis. Method of forming a formlocking connection of two telescopic tubes and a formlocking connection formed thereby. 6,039,502, Cl. 403-282.000.

Nagahashi, Kenji: *See*—
Kawabe, Keiko; Matsuo, Akihiko; Kimura, Minako; Nagahashi, Kenji; and Uehara, Sanya, 6,041,177, Cl. 395-704.000.

Nagai, Michio: *See*—
Okumura, Yoichiro; Nagai, Michio; Terada, Hiroshi; and Maruyama, Atsushi, 6,041,187, Cl. 396-132.000.

Nagai, Nobuyuki: *See*—
Oono, Masahiro; Iwanade, Hisao; Saitoh, Noboru; Sato, Koji; Shiba, Sukenori; Yoshida, Tatsuya; and Nagai, Nobuyuki, 6,040,677, Cl. 318-696.000.

Nagai, Seiji: *See*—
Koide, Norikatsu; Asami, Shinya; Umezaki, Junichi; Koike, Masayoshi; Yamasaki, Shiro; and Nagai, Seiji, 6,040,588, Cl. 257-15.000.

Nagai, Yukihiro; and Mametani, Tomoharu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with moisture resistant fuse portion. 6,040,615, Cl. 257-529.000.

Nagakubo, Yasunori: *See*—
Miyazaki, Akimitsu; Ibukuro, Sadao; and Nagakubo, Yasunori, 6,040,931, Cl. 359-110.000.

Nagano, Akihiko: *See*—
Tsuboi, Takayuki; Yagyu, Mineto; Nagano, Akihiko; and Kikuchi, Hiroshi, 6,040,880, Cl. 349-5.000.

Nagaraj, Krishnaswamy, to Lucent Technologies, Inc. Circuit for optimal signal slicing in a binary receiver. 6,041,084, Cl. 375-317.000.

Nagaraj, Ravi: *See*—
Hart, Frank P.; Nagaraj, Ravi; Noble, James L.; and Songer, Neil W., 6,041,372, Cl. 710-62.000.

Nagasaka, Hideaki; Samoto, Haruhiko; Yashiro, Yoshinobu; and Higaki, Yoshiyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system for fuel injected engine. 6,039,029, Cl. 123-442.000.

Nagasawa, Tadahiko, to Amada Company, Limited. Method of bending operations and bending system using the same. 6,038,899, Cl. 72-14.800.

Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, to Daido Tokushuko Kabushiki Kaisha; and Nittan Valve Co., Ltd. High corrosion resisting alloy for diesel engine valve. 6,039,919, Cl. 420-446.000.

Nagata, Kinya: *See*—
Ogawa, Kazuyuki; Tanaka, Kazuya; Nagata, Kinya; and Takano, Syoichi, 6,040,426, Cl. 530-350.000.

Nagatani, Kazuo: *See*—
Fukumasa, Hidenobu; Oishi, Yasuyuki; Nagatani, Kazuo; and Hamada, Hajime, 6,041,034, Cl. 370-203.000.

Nagayama, Hitoshi; and Nezu, Motoi, to Speedfam Co., Ltd. Work planarizing method and apparatus. 6,039,638, Cl. 451-288.000.

Nagel, Joerg: *See*—
Mrosik, Jan Michael; Nagel, Joerg; and Stojanoff, Christo G., 6,040,898, Cl. 356-5.090.

Nagle, James Robert, II: *See*—

Kinal, George Vladimir; Nagle, James Robert, II; Soddu, Claudio; and Ryan, Fintan Richard, 6,040,798, Cl. 342-357.010.

Naiini, Ahmad A.: *See*—
Blakeney, Andrew J.; Medina, Arturo N.; Toukhy, Medhat A.; Ferreira, Lawrence; Jeffries, Alfred T., III; and Naiini, Ahmad A., 6,040,107, Cl. 430-165.000.

Naikal, Najibullah: *See*—
Diep, Vinh Hew; and Naikal, Najibullah, 6,041,121, Cl. 379-446.000.

Nailor, William K., III: *See*—
Clark, Stephen L.; Horchler, David C.; Stoner, Stuart C.; Pontius, Glenn J.; and Nailor, William K., III, 6,038,762, Cl. 29-739.000.

Naito, Takashi: *See*—
Yamamoto, Hiroki; Naito, Takashi; Namekawa, Takashi; Takahashi, Ken; Watanabe, Masahiro; and Takeo, Noriyuki, 6,040,029, Cl. 428-64.100.

Naka, Akio; Yamamoto, Tetsuya; and Mori, Yoshikuni, to Nippon Shokubai Co., Ltd. Carrier particles for use in electrostatic image development and electrostatic image developer. 6,040,101, Cl. 430-108.000.

Naka, Hiroyuki: *See*—
Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.

Nakabayashi, Ken-ichi: *See*—
Murakami, Hiroshi; Yoshioka, Koji; Morita, Keizo; Itokazu, Masafumi; Nakabayashi, Ken-ichi; Yamamoto, Akira; and Haraguchi, Munehiro, 6,040,814, Cl. 345-94.000.

Nakada, Mitsuyuki: *See*—
Fujii, Nobuhiko; Nakada, Mitsuyuki; and Aoki, Kazuomi, 6,040,377, Cl. 524-571.000.

Nakadaira, Shiro: *See*—
Tanaka, Tetsuya; Tsuzuki, Koichi; Nishijima, Noriyo; Handa, Fumitaka; and Nakadaira, Shiro, 6,039,866, Cl. 210-136.000.

Nakagawa, Kazumoto: *See*—
Himeshima, Tomoharu; Nakagawa, Kazumoto; Iwai, Tatsuo; and Watanabe, Takayuki, 6,039,892, Cl. 252-188.280.

Nakagawa, Susumu: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.

Nakagawa, Taizo: *See*—
Takeshita, Naoki; Kusano, Manabu; Sagawa, Fumihiko; and Nakagawa, Taizo, 6,040,529, Cl. 174-254.000.

Nakagawa, Takao; and Tsuda, Tadayuki, to Canon Kabushiki Kaisha. Developer detecting apparatus for detecting the position of an upper surface of developer contained in a container and process cartridge comprising such apparatus. 6,041,196, Cl. 399-27.000.

Nakagawa, Yoshio: *See*—
Kimura, Nobutake; Ariga, Masato; Yamakawa, Hirohito; Nakagawa, Yoshio; and Shimizu, Akio, 6,040,495, Cl. 800-8.000.

Nakagawa, Yoshiro: *See*—
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Nakahama, Hidenari: *See*—
Ishida, Tatsuyoshi; Yasuda, Masaaki; Onishi, Hitoshi; Kihara, Noriaki; Tsutsui, Toshiyuki; Sagane, Toshihiro; Kawasaki, Masaaki; and Nakahama, Hidenari, 6,040,407, Cl. 526-281.000.

Nakahama, Tadamitsu: *See*—
Marutani, Yoshiaki; Tomita, Takashi; Nakahama, Tadamitsu; Uemura, Hiroyuki; Koga, Kazuhi; and Ohsawa, Mika, 6,040,009, Cl. 427-241.000.

Nakai, Yutaka: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.

Nakajima Cooper Works, Inc: *See*—
Nakajima, Masahiko; Yamasawa, Naoyuki; and Nakamura, Masaru, 6,039,237, Cl. 228-51.000.

Nakajima, Katsutoshi: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.

Nakajima, Kazuto: *See*—
Mitani, Masato; Nakajima, Kazuto; Kotani, Hiroyuki; Hokazono, Nobutaka; Naka, Hiroyuki; Yamaguchi, Akira; Ikeda, Junji; and Aoki, Nobuyuki, 6,040,016, Cl. 427-421.000.

Nakajima, Masahiko; Yamasawa, Naoyuki; and Nakamura, Masaru, to Nakajima Cooper Works, Inc. Heating tip and method of manufacturing the same. 6,039,237, Cl. 228-51.000.

Nakajima, Michio: *See*—
Kitaguchi, Akira; Hatakenaka, Makoto; Nakajima, Michio; Motonami, Kaoru; Shiroshima, Kiyoyuki; and Yamashita, Takekazu, 6,040,614, Cl. 257-529.000.

Nakajima, Yoshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle theft prevention device with a low powered receiver. 6,040,763, Cl. 340-427.000.

Nakamura, Masaki; and Yoshida, Satoshi, to Fuji Xerox Co., Ltd. Electrophotographic toner, electrophotographic developer, and image forming method. 6,040,104, Cl. 430-110.000.

Nakamura, Masaru, to Ricoh Company, Ltd. Spread spectrum pulse position modulation system. 6,041,074, Cl. 375-200.000.

Nakamura, Masaru: *See*—
Nakajima, Masahiko; Yamasawa, Naoyuki; and Nakamura, Masaru, 6,039,237, Cl. 228-51.000.

Nakamura, Masatsugu: *See*—
Nakata, Katsuhiko; Nakamura, Masatsugu; and Hamano, Takashi, 6,040,343, Cl. 514-549.000.

Nakamura, Shigeru: *See*—
Nakao, Yasushi; and Nakamura, Shigeru, 6,040,015, Cl. 427-407.100.

Nakamura, Shin: *See*—
Kurata, Mamoru; and Nakamura, Shin, 6,041,424, Cl. 714-33.000.

Nakamura, Tamotsu, to Showa Corporation. Tilt cylinder device for outboard motor. 6,039,617, Cl. 440-61.000.

Nakamura, Yasushi, to Shimano, Inc. Multiple sprocket assembly for a bicycle. 6,039,665, Cl. 474-157.000.

Nakanishi, Akira: *See*—
Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 6,041,191, Cl. 396-311.000.

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Kanda, Motohiro; Yamamoto, Akira; Nakano, Toshio; and Yoshida, Minoru, 6,041,391, Cl. 711-112.000.

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Nakata, Yuji: *See*—
Ohtomo, Fumio; Nakata, Yuji; Fukuyama, Yoshitaka; Inomata, Asako; Shibuya, Sachio; Koga, Akinori; Ishii, Junji; Ito, Shoko; and Yamamoto, Hironobu, 6,038,850, Cl. 60-39.182.

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Mine, Katsutoshi; Mitani, Osamu; Nakayoshi, Kazumi; and Tazawa, Rikako, 6,039,831, Cl. 156-272.600.
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Namikawa, Makoto: *See*—
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.

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Jen, Zo-Chun, 6,038,847, Cl. 57-908.000.

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Popoff, Christine; Nartey, Alwyn; Gabriel, Robert; and Aubay, Eric, 6,040,288, Cl. 510-466.000.

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Fado, Frank; Guasti, Peter; Nassiff, Amado; and VanBuskirk, Ronald, 6,041,301, Cl. 704-270.000.

Nation, George Wayne: *See*—
Earl, Joel Ray; Goodman, David John; and Nation, George Wayne, 6,041,324, Cl. 707-9.000.

National Aeronautics and Space Administration, The United States of America as represented by Administration of the: *See*—
Hung, Ching-Cheh, 6,039,930, Cl. 423-592.000.

National Education Corporation: *See*—
L'Allier, James J.; Welsh, Sally H.; Nielsen, Boyd W.; Miles, Kurt W.; Myers, Ken L.; Henrie, Stephen P.; Norberg, Michael I.; and Helliwell, Laura I., 6,039,575, Cl. 434-323.000.

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Kupfer, Abraham; Kupfer, Hannah; and Monks, Colin R. F., 6,040,152, Cl. 435-29.000.

National Molding Corporation: *See*—
Anscher, Joseph; and Capiello, Raymond, 6,038,746, Cl. 24-115.00G.

National Registry, Inc., The: *See*—
Merjanian, John Michael, 6,041,134, Cl. 382-126.000.

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Blair, Christopher S., 6,040,606, Cl. 257-384.000.
Henry, Paul M., 6,040,718, Cl. 327-71.000.
Qureshi, Fazal Ur Rehman, 6,041,426, Cl. 714-719.000.

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Carrier, Allen M.; Humphreys, Robert W. R.; and Petersen, Paul M., 6,040,406, Cl. 526-238.220.

Natsume, Munehiro: *See*—
Fujikura, Teruhiko; Kinoshita, Naoyoshi; Fujii, Makoto; Matsuhara, Kenji; and Natsume, Munehiro, 6,041,214, Cl. 399-403.000.

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Naumann, Heinz: *See*—
Bach, Guenther; and Naumann, Heinz, 6,039,634, Cl. 451-49.000.

Naura, David, to STMicroelectronics S.A. Method for writing in an electrically modifiable non-volatile memory. 6,040,994, Cl. 365-185.180.

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Rainbow, David J., 6,040,040, Cl. 428-212.000.

Neag, Dorinel; Meidanis, Stylianos A.; and Carbone, Thomas R., to Chrysler Corporation. Hinge assembly. 6,038,738, Cl. 16-324.000.

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Okamoto, Akihiko; and Ito, Fuminori, 6,040,973, Cl. 361-235.000.

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Aiso, Fumiki, 6,040,236, Cl. 438-486.000.
Akiyama, Yutaka, 6,041,174, Cl. 395-500.330.
Anzai, Makoto, 6,041,085, Cl. 375-326.000.
Banno, Satoshi, 6,040,782, Cl. 340-825.250.
Hagiwara, Yoshihiro; Suetsugu, Junichi; Mizoguchi, Tadashi; Minemoto, Hitoshi; Takemoto, Hitoshi; Shima, Kazuo; and Yakushiji, Toru, 6,039,442, Cl. 347-89.000.
Harano, Nobuya, 6,040,804, Cl. 343-702.000.
Hasegawa, Takumi, 6,041,168, Cl. 395-500.070.
Hisamune, Yosiaki, 6,040,234, Cl. 438-439.000.
Hori, Takeshi; Uezono, Tsutomu; Yoshii, Tomoyuki; and Funayama, Yasuhiro, 6,040,106, Cl. 430-127.000.
Kakehashi, Eiichirou, 6,040,242, Cl. 438-672.000.
Kamishima, Yoshiyuki, 6,041,434, Cl. 714-807.000.
Kamiya, Hiroshi, 6,040,724, Cl. 327-170.000.
Kashihara, Mabumi, 6,041,197, Cl. 399-50.000.
Kazo, Osamu; and Kokubo, Tsuyoshi, 6,039,412, Cl. 311-39.100.
Kishimoto, Kazunori, 6,040,709, Cl. 326-59.000.
Kudoh, Kazuhiro, 6,041,218, Cl. 455-38.400.
Matsubara, Yoshihisa, 6,040,240, Cl. 438-618.000.
Mimura, Kazuya, 6,040,975, Cl. 361-523.000.
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Nishio, Makoto; and Watanabe, Hiromitsu, 6,041,037, Cl. 370-228.000.
Nozaki, Takeo; and Nishii, Satoshi, 6,040,911, Cl. 356-394.000.
Onoda, Naka, 6,040,583, Cl. 250-492.220.
Takaishi, Yoshihiro, 6,040,215, Cl. 438-253.000.
Takatori, Ken-Ichi; and Sumiyoshi, Ken, 6,040,889, Cl. 349-174.000.
Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, 6,041,082, Cl. 375-300.000.
Tanoue, Katsumi, 6,041,238, Cl. 455-452.000.
Tsuchiya, Tomohiro, 6,041,006, Cl. 365-210.000.
Uchida, Jun, 6,040,738, Cl. 329-302.000.
Yamaguchi, Yasuhiro, 6,041,342, Cl. 709-202.000.
Yanagi, Kenzo, 6,041,213, Cl. 399-401.000.
Yanagisawa, Masahiro, 6,040,031, Cl. 428-65.400.
Yoshimoto, Susumu; and Yamamoto, Yasushi, 6,040,651, Cl. 310-313.00B.

NEC Research Institute, Inc.: *See*—
Kim, Tae Jin; Thio, Tineke; and Ebbesen, Thomas Wren, 6,040,936, Cl. 359-245.000.

Neckers, Len: *See*—
Myers, Charles; Trepel, Jane; Kang, Won Ki; Whitesell, Luke; and Neckers, Len, 6,040,334, Cl. 514-460.000.

NEDCON Magazijninrichting B. V.: *See*—
Hollander, Rudolf Richard, 6,039,192, Cl. 211-186.000.

Neelchine Engineering, Inc.: *See*—
Neeley, Rocky E.; and Lane, James N., 6,038,893, Cl. 70-175.000.

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Lupo, Donald; Remmers, Marcus; and Neher, Dieter, 6,040,069, Cl. 428-690.000.

Neher, Erwin; and Würriehausen, Frank, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method and device for controlling fast periodic motion. 6,040,567, Cl. 250-206.000.

Nehse, Wolfgang: *See*—
John, Thomas; Kuhn, Thomas; and Nehse, Wolfgang, 6,041,276, Cl. 701-67.000.

Nelson, Dale H.; and Koullias, Iconomos A., to Lucent Technologies, Inc. Active substrate noise injection cancellation. 6,040,728, Cl. 327-292.000.

Nelson, J. Robert, Jr.: *See*—
Fleischhauer, Grier S.; Higgins, Charles T.; Losee, D. Bruce; Nelson, J. Robert, Jr.; Ripley, Robert L.; Sano, Masato; Sharpe, David E.; and Watkins, Michael L., 6,040,560, Cl. 219-494.000.

Nelson, Ricky F. Seat for use on an inner tube. 6,038,991, Cl. 114-131.000.

Nemoto, Akira, to Tachi-S Co., Ltd. Seat provided with a seat climbing/descending aid structure for easy climbing onto and descending from the seat, and a seat climbing/descending aid designed for that purpose. 6,039,402, Cl. 297-411.340.

Nemoto, Minehiro: *See*—
Shiina, Kazuhiro; Kawamoto, Koji; Miura, Masato; Ohura, Hitoshi; Ozeki, Shoichi; Akiyama, Noboru; Nunomura, Kuniharo; Nemoto, Minehiro; and Iwamura, Masahiro, 6,040,827, Cl. 345-208.000.

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Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.

NeoMagic Corporation: *See*—
Puar, Deepraj S.; and Ranganathan, Ravi, 6,041,010, Cl. 365-226.000.

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Jordi, Hans Ulrich, 6,039,199, Cl. 215-254.000.

Nesburn, Anthony B.: *See*—
Karageozian, Hampar L.; Karageozian, Vicken H.; Kenney, Maria Cristina; Gutierrez Flores, Jose Luis; Carpio Aragon, Gabriel Arturo; and Nesburn, Anthony B., 6,039,943, Cl. 424-94.620.

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Mallangi, Chandrasekhar R; Sher, Alexander A.; Fuchs, Eileen Carol; Vadehra, Dharam Vir; and Wedral, Elaine Regina, 6,039,986, Cl. 426-74.000.

Netravali, Arun N.: *See*—
La Porta, Thomas F.; and Netravali, Arun N., 6,041,103, Cl. 379-67.100.

Neubauer, Edwin P. Razor conditioner. 6,039,937, Cl. 424-73.000.

NeuralStem Biopharmaceuticals, Ltd.: *See*—
Johe, Karl K., 6,040,180, Cl. 435-377.000.

Neurogen Corporation: *See*—
Greenlee, William; Gangly, Ashit; and Wasley, Jan W. F., 6,040,448, Cl. 544-363.000.
Yuan, Jun; and Chen, Xi, 6,040,459, Cl. 549-43.000.

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Burnie, James Peter, 6,039,959, Cl. 424-234.100.

Neville, Richard L., to Nevilog, Inc. Log turning machine guides. 6,039,094, Cl. 144-4.000.

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Neville, Richard L., 6,039,094, Cl. 144-4.000.

New Focus, Inc.: *See*—
Bortz, Michael L.; and Godil, Asif A., 6,040,914, Cl. 356-435.000.

New Venture Gear, Inc.: *See*—
Szczepanski, Gerald; and Forsyth, John, 6,038,938, Cl. 74-473.240.

Newcomer, Kevin L.: *See*—
Edwards, David H.; Newcomer, Kevin L.; and Niehaus, K. Lynn, 6,039,546, Cl. 417-61.000.

Newman, Roger R. Adjustable router guide platform with integrated clamp. 6,039,095, Cl. 144-144.520.

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Getselis, Arkady; Newman, Walter; and Tufano, Anthony, 6,039,597, Cl. 439-441.000.

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Kho, Samuel P., 6,041,351, Cl. 709-224.000.

Newnes, William R.: *See*—
Kennedy, Joe B.; Davyduke, Roland; Jackson, James G.; Hannebauer, James B.; Newnes, William R.; Stroud, Brian; and Sergeant, John, 6,039,097, Cl. 144-357.000.
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Panchou, Karen A.; Newton, Charles M.; and Rosier, Charles D., 6,040,630, Cl. 257-783.000.

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Caldwell, J. Michael, 6,040,251, Cl. 442-123.000.

Ney, Hermann: *See*—
Welling, Lutz; and Ney, Hermann, 6,041,296, Cl. 704-209.000.

Nezu, Motoi: *See*—
Nagayama, Hitoshi; and Nezu, Motoi, 6,039,638, Cl. 451-288.000.

Ng, John Shek-Luen: *See*—
Ju, Dz Ching; Ng, John Shek-Luen; and Sarkar, Vivek, 6,041,181, Cl. 395-709.000.

Ng, Tony; and Murphy, Mike, to Aquafine Corporation. Tubular lamp with transparent protective outer sleeve having one open end for receiving tubular glass lamp body with terminal pin electrical connector. 6,039,460, Cl. 362-267.000.

Ngai, Agnes Y.: *See*—
Boice, Charles E.; Kaczmarczyk, John M.; Ngai, Agnes Y.; and Vachon, Michael P., 6,040,875, Cl. 348-595.000.

NGK Spark Plug Co., Ltd.: *See*—
Morita, Naotoshi; and Wakita, Sachio, 6,039,816, Cl. 134-19.000.

Ngo, Sang T.: *See*—
Huynh, Quoi V.; Ngo, Sang T.; Judkins, Joseph James, III; and Alfano, Donald E., 6,040,668, Cl. 318-471.000.

Nguyen, Binh Q.: Redpath, Richard J.; and Singhal, Sandeep Kishan, to International Business Machines Corp. Method and system for a hybrid peer-server communications structure. 6,041,343, Cl. 709-203.000.

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Black, David Glenn; Hinch, Garry Dale; Nguyen, Dat Quoc; and Srinivasan, Kasturi Rangan, 6,040,098, Cl. 430-59.600.

Nguyen, Sam Linh: *See*—
Dvorak, Charles A.; Wren, Douglas L.; Fisher, Lawrence E.; Axt, Steven D.; Humphreys, Eric R.; Arzeno, Humberto B.; Beard, Colin C.; Nguyen, Sam Linh; Han, Yeun-Kwei; Roberts, Christopher R.; Lund, Jan P.; and Fatheree, Paul R., 6,040,446, Cl. 544-276.000.

Nicca Chemical Co., Ltd.: *See*—
Mizuno, Yuhei; Kawamura, Yoshihiro; and Kondo, Shiro, 6,039,766, Cl. 8-142.000.

Nichols, Stacy W.: *See*—
Beshai, Maged E.; and Nichols, Stacy W., 6,041,040, Cl. 370-232.000.

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Nickey, George A.: *See*—
Flynn, Robin L.; Hayes, Dan M.; and Nickey, George A., 6,038,888, Cl. 65-304.000.

Nickias, Peter N.; Marks, Tobin J.; and Obora, Yasushi, to Dow Chemical Company, The; and Northwestern University. Saturated tricyclic ligand containing metal complexes and olefin polymerization process. 6,040,401, Cl. 526-160.000.

Nicoletta, Carmine: *See*—
Sanchez, Hector; Alvarez, Jose M.; Siegel, Joshua; and Nicoletta, Carmine, 6,040,729, Cl. 327-309.000.

Nicox S.A.: *See*—
Del Soldato, Piero; and Sannicolo', Francesco, 6,040,341, Cl. 514-509.000.

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Edwards, David H.; Newcomer, Kevin L.; and Niehaus, K. Lynn, 6,039,546, Cl. 417-61.000.

Nielsen, Boyd W.: *See*—
L'Allier, James J.; Welsh, Sally H.; Nielsen, Boyd W.; Miles, Kurt W.; Myers, Ken L.; Henrie, Stephen P.; Norberg, Michael I.; and Helliwell, Laura I., 6,039,575, Cl. 434-323.000.

Nielsen, Peter Madelaire: *See*—
Burns, Clay Allen; Nielsen, Peter Madelaire; Sullivan, John Aloysius; and Sullivan, Frederic Ballou-Viaux, 6,039,329, Cl. 280-11.190.

Nifco Inc.: *See*—
Nishina, Yuji; and Kimisawa, Toshihide, 6,039,296, Cl. 248-311.200.

Niimi, Tomohiro: *See*—
Yamane, Kazuyasu; Oikawa, Takeya; and Niimi, Tomohiro, 6,041,244, Cl. 455-575.000.

Nijhof, Engbert B. G.: *See*—
Bucks, Marcel J. M.; and Nijhof, Engbert B. G., 6,040,663, Cl. 315-291.000.

Nika Health Products Limited: *See*—
Glück, Reinhard; Klein, Peter; Herrmann, Peter; and Wälti, Ernst Rudolf, 6,040,167, Cl. 435-235.100.

Nikon Corporation: *See*—
Enichen, William A.; and Robinson, Christophe F., 6,040,095, Cl. 430-5.000.
Inoue, Hideya; and Takemoto, Masami, 6,041,184, Cl. 396-51.000.
Kakizaki, Yukio; Kiuchi, Toru; Amano, Kesayoshi; and Umatate, Toshikazu, 6,040,096, Cl. 430-5.000.
Ono, Kazuya, 6,040,675, Cl. 318-649.000.

Nill, Andrew J., Jr. Roof vents with moisture detectors and roof systems incorporating same. 6,040,775, Cl. 340-604.000.

Nims, Robert A.; O'Brien, Patrick Lee; and Emerson, Terrence, to Allied-Signal, Inc. Microturbine power generating system. 6,040,635, Cl. 290-52.000.

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Nine West Group, Inc.: *See*—
Pyle, Clifford L.; and Ludemann, John F., 6,038,790, Cl. 36-30.00R.

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Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, 6,041,082, Cl. 375-300.000.

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Yamazaki, Motohiro; Ando, Shuichi; and Toyama, Akira, 6,041,291, Cl. 702-191.000.

Nippon Sanso Corporation: *See*—
Wu, Shang-Qian; Morishita, Jun-ichi; Ishihara, Yoshio; and Kimijima, Tetsuya, 6,040,915, Cl. 356-435.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Anzaki, Toshiaki; and Ogino, Etsuo, 6,040,056, Cl. 428-432.000.

Nippon Shokubai Co., Ltd.: *See*—
Naka, Akio; Yamamoto, Tetsuya; and Mori, Yoshikuni, 6,040,101, Cl. 430-108.000.

Nippon Steel Corp.: *See*—
Nishida, Takanobu; and Jikuhara, Ichiro, 6,040,789, Cl. 341-50.000.

Nippon Zoki Pharmaceuticals Co., Ltd.: *See*—
Hotta, Nigishi; and Fujisawa, Hiroki, 6,040,326, Cl. 514-386.000.

Nishida, Hideo: *See*—
Kobayashi, Hiromi; Nishida, Hideo; Miura, Haruo; Eino, Takashi; and Takahashi, Kazuki, 6,039,535, Cl. 415-172.100.

Nishida, Hirobumi, to Ricoh Company, Ltd. Method and device for extracting features from gray-scale image and generating boundaries of document elements. 6,041,138, Cl. 382-197.000.

Nishida, Koji: *See*—
Kurasawa, Yoshihiro; and Nishida, Koji, 6,040,084, Cl. 429-176.000.

Nishida, Masatsugu; Ikeda, Toru; and Yokoyama, Tomoki, to Fujitsu Limited. Motor driving device, method of adjusting the same, and information storage device. 6,040,674, Cl. 318-632.000.

Nishida, Shinsuke, to Fourie Inc. Apparatus for spacially changing sound with display location and window size. 6,040,831, Cl. 345-340.000.

Nishida, Takanobu; and Jikuhara, Ichiro, to Nippon Steel Corp. Data conversion system. 6,040,789, Cl. 341-50.000.

Nishii, Satoshi: *See*—
Nozaki, Takeo; and Nishii, Satoshi, 6,040,911, Cl. 356-394.000.

Nishijima, Noriyo: *See*—
Tanaka, Tetsuya; Tsuzuki, Koichi; Nishijima, Noriyo; Handa, Fumitaka; and Nakadaira, Shiro, 6,039,866, Cl. 210-136.000.

Nishikawa, Hideki: *See*—
Imoto, Kazunobu; Oshima, Katsuyuki; and Nishikawa, Hideki, 6,040,269, Cl. 503-227.000.

Nishikawa, Kohei; Shibouta, Yumiko; and Kubo, Keiji, to Takeda Chemical Industries, Inc. Prophylactic or therapeutic drug for renal diseases. 6,040,324, Cl. 514-381.000.

Nishiki, Kenya: *See*—
Sugauchi, Kiminori; Hirata, Toshiaki; Nishiki, Kenya; Miyazaki, Satoshi; Mizuguchi, Keizo; and Fujino, Shuji, 6,041,349, Cl. 709-223.000.

Nishikibe, Masaru: *See*—
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 6,040,449, Cl. 546-193.000.

Nishimura, Koichi; Kawamura, Tatsuya; and Fujioka, Toyozo, to Idemitsu Petrochemical Co., Ltd. Copolymer, hydrogenated product thereof, and process for producing the same. 6,040,388, Cl. 525-332.100.

Nishimura, Masaharu; Ohnishi, Keizo; Yasuda, Chiaki; Kajii, Shinichiro; Patrick, William P.; and Zander, Anthony C., to Mitsubishi Jukogyo Kabushiki Kaishal; and United Technologies Corporation. Active acoustic wall. 6,041,125, Cl. 381-71.400.

Nishimura, Naoto: *See*—

Yamada, Kazuo; Mitate, Takehito; Nishimura, Naoto; Tsukuda, Yoshihiro; and Minato, Kazuaki, 6,040,092, Cl. 429-331.000.
Nishimura, Toshio, to Sharp Kabushiki Kaisha. Display device having display and imaging pixels sandwiched between same substrates. 6,040,810, Cl. 345-87.000.
Nishina, Yuji; and Kimisawa, Toshihide, to Honda Giken Kogyo Kabushiki Kaisha; and Nifco Inc. Beverage container holder for a vehicle. 6,039,296, Cl. 248-311.200.
Nishino, Tokuzo: *See*—
Narita, Keishi; Ishida, Chika; Takeuchi, Yoshie; Ohto, Chikara; Ohnuma, Shinichi; and Nishino, Tokuzo, 6,040,165, Cl. 435-193.000.
Nishio, Koji: *See*—
Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji; Fujimoto, Masahisa; Nohma, Toshiyuki; and Nishio, Koji, 6,040,090, Cl. 429-231.950.
Nishio, Makoto; and Watanabe, Hiromitsu, to NEC Corporation. ATM virtual path switching node. 6,041,037, Cl. 370-228.000.
Nishioka, Kimihiko: *See*—
Ono, Katsuya; Shiraiwa, Masaru; and Nishioka, Kimihiko, 6,041,154, Cl. 385-116.000.
Nishioka, Kiyokazu: *See*—
Terada, Koichi; Kojima, Keiji; Fujikawa, Yoshifumi; Nojiri, Tohru; and Nishioka, Kiyokazu, 6,041,399, Cl. 712-24.000.
Nishioka, Mototsugu; Umeki, Hisashi; and Matsui, Susumu, to Hitachi, Ltd. Key distribution method and system in secure broadcast communication. 6,041,408, Cl. 713-171.000.
Nishiwaki, Jiro: *See*—
Mikami, Kazuhiro; Yamada, Kazuhito; and Nishiwaki, Jiro, 6,039,673, Cl. 477-93.000.
Nishiyama, Hiroshi: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.
Niska, Håkan; Kvarnström, Bo; and Oom, Jan, to Telefonaktiebolaget LM Ericsson. Open 'plug and play' O and M architecture for a radio base station. 6,041,228, Cl. 455-419.000.
Nissan Chemical Industries, Ltd.: *See*—
Watanabe, Yoshitane; Suzuki, Keitaro; Koyama, Yoshinari; and Iijima, Motoko, 6,040,372, Cl. 524-413.000.
Nissan Motor Co., Ltd.: *See*—
Adachi, Kazutaka; and Watanabe, Akira, 6,039,675, Cl. 477-174.000.
Fukui, Takayuki, 6,040,350, Cl. 521-135.000.
Iwano, Hiroshi; Kazama, Isamu; and Yasuoka, Masayuki, 6,039,025, Cl. 123-399.000.
Nisshin Flour Milling Co., Ltd.: *See*—
Kimura, Nobutake; Ariga, Masato; Yamakawa, Hirohito; Nakagawa, Yoshio; and Shimizu, Akio, 6,040,495, Cl. 800-8.000.
Nito, Keiichi: *See*—
Yasuda, Akio; Nito, Keiichi; Matsui, Eriko; Takanashi, Hidehiko; and Bao, Yang Ying, 6,040,884, Cl. 349-129.000.
Nitta, Satoru; and Mizunuma, Koji, to Toshiba Machine Co., Ltd. Method of adjusting a heat-displacing T-die. 6,039,904, Cl. 264-40.500.
Nitta, Takahisa: *See*—
Ohmi, Tadahiro; and Nitta, Takahisa, 6,039,814, Cl. 134-1.000.
Nittan Valve Co., Ltd.: *See*—
Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, 6,039,919, Cl. 420-446.000.
Nittetu Chemical Engineering Ltd.: *See*—
Shimoi, Yoichi; Tamura, Hideo; Okazaki, Masaomi; and Suganuma, Takao, 6,039,879, Cl. 210-641.000.
Nitto Denko Corporation: *See*—
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.
Niwa, Hisao: *See*—
Yamamoto, Hiroshi; Niwa, Hisao; Kojima, Yoshihiro; Maruno, Susumu; Kayashima, Kazuhiro; Kouda, Toshiyuki; Maekawa, Hidetsugu; Ito, Satoru; and Shimeki, Yasuharu, 6,041,141, Cl. 382-231.000.
Njoroge, F. George; Vibulbhan, Bancha; Pinto, Patrick A.; and Girijavallabhan, Viyyoor M., to Schering Corporation. Benzo(5,6)cycloheptapyridine cyclic ureas and lactams useful as farnesyl protein transferase inhibitors. 6,039,683, Cl. 574-274.000.
Njoroge, George F.: *See*—
Taveras, Arthur G.; and Njoroge, George F., 6,040,305, Cl. 514-232.800.
Noar, Scott R.: *See*—
Bangs, William E.; Dibenedetto, Joseph D.; Friedberg, Joyce L.; Giordano, Denise A.; Glover, Judy M.; Khoo, Chor San Heng; Ko, Sandy; MacNair, R. David C.; Noar, Scott R.; Randazzi, John J., Jr.; Stoever, Harro; and Ziegler, Paula J., 6,039,989, Cl. 426-106.000.
Noax B.V.: *See*—
Raab, Francis J., 6,038,958, Cl. 91-486.000.
Noble, David: *See*—
Kennelly, Kevin; Gardiner, Ian; Noble, David; and Muliadiredja, Achmad R., 6,039,507, Cl. 405-227.000.
Noble, James L.: *See*—
Hart, Frank P.; Nagaraj, Ravi; Noble, James L.; and Songer, Neil W., 6,041,372, Cl. 710-62.000.
Noda, Masayuki: *See*—
Ootuka, Minoru; Hiraoka, Hirokazu; Shimadu, Toru; and Noda, Masayuki, 6,040,252, Cl. 442-169.000.
Noda, Takehiko: *See*—
Tomikawa, Ichiro; Soga, Mitsuhide; Fujii, Katsuyuki; Ogawa, Katsuhide; Yoshida, Junichi; Kawachi, Shigeo; and Noda, Takehiko, 6,039,441, Cl. 347-86.000.
Noda, Toshiharu: *See*—
Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, 6,039,919, Cl. 420-446.000.
Noe, Reginald J.; and Stroud, Toni S. Grill lifting tool. 6,039,372, Cl. 294-10.000.
Nogi, Toshiharu: *See*—
Shiraishi, Takuya; Nogi, Toshiharu; Ohsuga, Minoru; Nakayama, Yoko; and Tokuyasu, Noboru, 6,039,026, Cl. 123-399.000.
Noguchi, Hiromichi; Sugitani, Hiroshi; Koizumi, Yutaka; Inamoto, Tadayoshi; Aono, Kiyomi; and Nakata, Yoshie, to Canon Kabushiki Kaisha. Etching resist composition, pattern forming method making use of the same, printed-wiring board and its production. 6,040,002, Cl. 427-96.000.
Noguchi, Mitsuhiro; and Oowaki, Yukihito, to Kabushiki Kaisha Toshiba. Semiconductor device. 6,040,610, Cl. 257-392.000.
Noguchi, Takaharu: *See*—
Okamoto, Hiroo; Hosokawa, Kyoichi; Owashi, Hitoaki; Tachibana, Hiroaki; and Noguchi, Takaharu, 6,041,161, Cl. 386-112.000.
Noguchi, Toshitada: *See*—
Takenouchi, Kenji; Hamamoto, Tomoki; and Noguchi, Toshitada, 6,040,158, Cl. 435-89.000.
Noguchi, Yuji, to Aisin Seiki Kabushiki Kaisha. Valve timing control device. 6,039,016, Cl. 123-90.170.
Nohma, Toshiyuki: *See*—
Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji; Fujimoto, Masahisa; Nohma, Toshiyuki; and Nishio, Koji, 6,040,090, Cl. 429-231.950.
Noishiki, Takayuki: *See*—
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.
Nojiri, Tohru: *See*—
Terada, Koichi; Kojima, Keiji; Fujikawa, Yoshifumi; Nojiri, Tohru; and Nishioka, Kiyokazu, 6,041,399, Cl. 712-24.000.
Nojiri, Toshiyuki; and Saito, Shinichi, to Ishizuka Electronics Corporation. Frost detecting device. 6,038,872, Cl. 62-140.000.
Nokia Mobile Phones, Ltd.: *See*—
Gortz, Udo, 6,041,298, Cl. 704-223.000.
Oksanen, Markku Tapio; Peranto, Juha; and Vuorio, Martti Ensio, 6,041,234, Cl. 455-434.000.
Olkkola, Jari, 6,041,120, Cl. 379-433.000.
Turner, Clive Nathan, 6,041,229, Cl. 455-420.000.
Nokia Telecommunications Oy: *See*—
Aalto, Risto, 6,041,235, Cl. 455-437.000.
Kilkki, Matti Kalevi; and Ruutu, Jussi Pekka Olavi, 6,041,039, Cl. 370-230.000.
Siira, Mikko, 6,041,230, Cl. 455-422.000.
Nomoto, Takashi: *See*—
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 6,040,449, Cl. 546-193.000.
Noone, Michael J.: *See*—
Stahl, Kermit E.; Noone, Michael J.; and Quaranta, Joseph, 6,038,826, Cl. 52-554.000.
Norand Corporation: *See*—
Durbin, Dennis A.; and Danielson, Arvin D., 6,039,258, Cl. 235-472.010.
Norberg, Michael I.: *See*—
L'Allier, James J.; Welsh, Sally H.; Nielsen, Boyd W.; Miles, Kurt W.; Myers, Ken L.; Henrie, Stephen P.; Norberg, Michael I.; and Hellwell, Laura I., 6,039,575, Cl. 434-323.000.
Norblad, Olof: *See*—
Markström, Lars; Zander, Lennarth; Olofsson, Erik; and Norblad, Olof, 6,038,855, Cl. 60-323.000.
Nord-Micro Elektronik Feinmechanik AG: *See*—
Wandel, Hermann; Jost, Michael; Sommer, Helmut; and Fischer-Wilk, Robert, 6,038,932, Cl. 73-861.650.
Nordquist, Jack; Calahan, Mark J.; Damiano, Timothy J.; and Botka, Christopher M., to Parker-Hannifin Corporation. Passive electronic damping for step motor. 6,040,676, Cl. 318-696.000.
Nordson Corporation: *See*—
Faulkner, W. Harrison, III; Bullock, David; DeGray, Dennis; and Sarasohn, Neil, 6,039,217, Cl. 222-146.500.
Noréus, Sture E. O.: *See*—
Brännland, Rolf C. A.; and Noréus, Sture E. O., 6,039,837, Cl. 162-29.000.
Noritsu Koki Co., Ltd.: *See*—
Motooka, Eiji, 6,040,896, Cl. 355-72.000.
Norizuki, Akira: *See*—
Kataoka, Ichiro; Aoki, Kunimitsu; Furuya, Yoshiyuki; Matsushita, Junichi; Nishiyama, Hiroshi; Nakajima, Katsutoshi; Norizuki, Akira; Murakami, Katsumi; and Amari, Takeyuki, 6,040,760, Cl. 340-425.500.
Nortel Networks Corporation: *See*—
Bernardin, Charles P.; and Yee, Meng F., 6,041,236, Cl. 455-446.000.
Beshai, Maged E.; and Nichols, Stacy W., 6,041,040, Cl. 370-232.000.
Khaleghi, Farideh; Solheim, Alan Glen; and Barnard, Chris Wilhelm, 6,040,933, Cl. 359-124.000.
Shelton, Brian R., 6,041,111, Cl. 379-201.000.
Thomas, Robert McLaren, 6,041,223, Cl. 455-326.000.

North Caroline State University: *See*—
Stomp, Anne-Marie; and Rajbhandari, Nirmala, 6,040,498, Cl. 800-294.000.
Northern Research and Engineering Corp: *See*—
Stoner, George S.; and Schoonmaker, Peter M., 6,039,534, Cl. 415-162.000.
Northern Telecom Limited: *See*—
Smith, Martin Stevens; Smith, Adrian David; Dalley, James Edward Joseph; and McKenna, Stephen John, 6,040,802, Cl. 343-700.0MS.
Northrop Grumman Corporation: *See*—
Davidson, Steven Frederic; Vollendorf, Kim David; DiCicco, Michael Frank; Collar, Stuart John; and Stone, Jeffrey Jay, 6,041,243, Cl. 455-575.000.
Sher, Richard Alan, 6,041,379, Cl. 710-129.000.
Northwestern University: *See*—
Nickias, Peter N.; Marks, Tobin J.; and Obora, Yasushi, 6,040,401, Cl. 526-160.000.
Nose, Sachiyuki, to Matsushita Electronics Corporation. Semiconductor device and wiring body. 6,040,621, Cl. 257-666.000.
Nova, Richard C.: *See*—
Sullivan, Joseph L.; Borschowa, Lawrence A.; and Nova, Richard C., 6,041,254, Cl. 607-5.000.
Novak, Mark A.: *See*—
Messick, DeLaun T.; and Novak, Mark A., 6,039,073, Cl. 137-515.700.
Novartis AG: *See*—
Dietrich, Paul S.; Van Grinsven, Martinus Quirinus Joseph Marie; Gielen, Johannes Jacobus Ludgerus; de Haas, Johannes Maria; and Van Driel, Roeland, 6,040,185, Cl. 435-468.000.
Gabe, Howard L., 6,040,501, Cl. 800-312.000.
Hemmings, Brian Arthur; and Millward, Thomas Anders, 6,040,164, Cl. 435-189.000.
Hirt, Thomas; Baron, Richard Carlton; Lohmann, Dieter; and Meier, Wolfgang Peter, 6,039,913, Cl. 264-331.110.
Threlkeld, Kevin; and McClure, Donald, 6,040,502, Cl. 800-312.000.
Novartis Finance Corporation: *See*—
Law, Marcus Dixon; and Dietz, Jon M., 6,040,496, Cl. 800-280.000.
Rice, Douglas; Carozzi, Nadine; Anderson, David M.; Rajasekaran, Kanniah; Rangan, Thirumale S.; Yenofsky, Richard; and Lotstein, Richard, 6,040,504, Cl. 800-314.000.
Novartis Nutrition AG: *See*—
Cracauer, Raymond F.; and Michels, Lester D., 6,039,714, Cl. 604-174.000.
Novason Corporation: *See*—
Walker, William F.; Toth, Cynthia A.; and Davidsen, Richard E., 6,039,691, Cl. 600-452.000.
Novellus Systems, Inc.: *See*—
Raaijmakers, Ivo J.; Burkhart, Chris W.; Christensen, David; and Susoeff, Michael N., 6,039,074, Cl. 137-537.000.
Novo Nordick A/S: *See*—
Lassen, Soren Flensted; Bech, Lisbeth; Ohmann, Anders; Breinholt, Jens; Fuglsang, Claus Crone; and Ostergaard, Peter Rahbek, 6,039,942, Cl. 424-94.600.
Novo Nordisk A/S: *See*—
Andersen, Knud Erik; Jørgensen, Tine Krogh; Hohlweg, Rolf; Fischer, Erik; Olsen, Uffe Bang; Polivka, Zdenek; Sindelar, Karel; and Valenta, Vladimir, 6,040,318, Cl. 514-329.000.
Berkner, Kathleen L.; Petersen, Lars Christian; Hart, Charles E.; Hedner, Ulla; and Bregengaard, Claus, 6,039,944, Cl. 424-94.640.
Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.
Madsen, Ole Dragsbaek; Michelsen, Birgitte Koch; Petersen, Jacob Steen; Roep, Bart O.; and Teisner, Borge, 6,040,134, Cl. 435-4.000.
Wagner, Peter; and Si, Joan Qi, 6,039,982, Cl. 426-18.000.
Wagner, Peter; and Si, Joan Qi, 6,039,983, Cl. 426-18.000.
Nowak, David: *See*—
Cummings, Tom; Nowak, David; and Chang, Byung Jin, 6,039,461, Cl. 362-287.000.
Nozaki, Takeo; and Nishii, Satoshi, to NEC Corporation. Reference image forming method and pattern inspection apparatus. 6,040,911, Cl. 356-394.000.
Nozawa, Shinya: *See*—
Yamada, Yoshikuni; Nozawa, Shinya; and Yamada, Yutaka, 6,038,776, Cl. 33-18.100.
NSM Aktiengesellschaft: *See*—
Schulze, Ullrich, 6,039,649, Cl. 463-16.000.
NTN Corporation: *See*—
Furukawa, Taichiro; Kondoh, Kohhei; Yamashita, Atsushi; and Kanbori, Seiji, 6,039,475, Cl. 384-580.000.
Nudelman, Abraham: *See*—
Rephaeli, Ada; and Nudelman, Abraham, 6,040,342, Cl. 514-548.000.
Nunan, John G., to Asec Manufacturing General Partnership. Methods of making highly dispersed substantially uniform cerium and zirconium mixed-metal-oxide composite supports for exhaust conversion catalysts. 6,040,265, Cl. 502-242.000.
Nunomura, Kunihoro: *See*—
Shiina, Kazuhiro; Kawamoto, Koji; Miura, Masato; Ohura, Hitoshi; Ozeki, Shoichi; Akiyama, Noboru; Nunomura, Kunihoro; Nemoto, Minehiro; and Iwamura, Masahiro, 6,040,827, Cl. 345-208.000.
Nuriyev, Barat: *See*—
Agalarov, Jafar; Nasibova, Ayten; and Nuriyev, Barat, 6,039,011, Cl. 123-51.0AA.
Nutt, Alan C. G.: *See*—
Hirsh, Jeffrey I.; Revelli, Joseph F., Jr.; and Nutt, Alan C. G., 6,040,857, Cl. 348-241.000.
Nutt, Stephen L.: *See*—
Kamboj, Rajender; Elliott, Candace E.; and Nutt, Stephen L., 6,040,175, Cl. 435-325.000.
NV Owens-Corning S.A.: *See*—
Jander, Michael Horst, 6,038,949, Cl. 83-13.000.
Nyacol Products, Inc.: *See*—
Catone, David L., 6,040,371, Cl. 524-409.000.
Nyce, Jonathan W., to East Carolina University. Specific antisense oligonucleotide composition & method for treatment of disorders associated with bronchoconstriction and lung inflammation. 6,040,296, Cl. 514-44.000.
Nygren, William D., to Lockheed Martin Corporation. Hinge for deployable truss. 6,038,736, Cl. 16-275.000.
Nynex Science and Technology Inc.: *See*—
Citron, Howard M.; Asano, David K.; Baietto, Henry R.; Chen, Sullivan S.; De Frondeville, Alexis W.; Hahn, Jeffrey H.; Probst, Thomas J., Jr.; Massucci, John E.; Costin, Dinu; and Peragine, Ralph E., 6,038,952, Cl. 83-605.000.
Nypro Inc.: *See*—
Cote, Andrew L., Sr.; and Ganem, Charles F., 6,039,302, Cl. 251-149.100.
O.M.D. Optical Memory Devices, Ltd.: *See*—
Glushko, Boris, 6,039,898, Cl. 264-1.330.
O, Waho; and Katsuyama, Tsutomu, to Oki Electric Industry Co., Ltd. CDMA transmitter having a variable gain circuit inserted between a transmitter mixer and a transmitter antenna. 6,041,081, Cl. 375-297.000.
Oak Technology, Inc.: *See*—
Quan, Thomas A.; and Grimsley, John L., 6,041,028, Cl. 369-44.340.
Oakley, Inc.: *See*—
Jarvis, Edward C., 6,038,705, Cl. 2-424.000.
OB Inovations, Inc.: *See*—
Sliwa, Jack; and Blumenfeld, Lee A., 6,039,701, Cl. 600-588.000.
Obana, Katsumi: *See*—
Iwata, Naohiro; Obana, Katsumi; Terashima, Hideyuki; and Aoki, Noriyuki, 6,040,919, Cl. 358-400.000.
Obayashi, Shunzi: *See*—
Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 6,041,191, Cl. 396-311.000.
Obejct Technology Licensing Corporation: *See*—
Webb, Richard D.; and Watanabe, Ryoji, 6,040,838, Cl. 345-433.000.
Obora, Yasushi: *See*—
Nickias, Peter N.; Marks, Tobin J.; and Obora, Yasushi, 6,040,401, Cl. 526-160.000.
OBrien, John; Scherer, Axel; Yariv, Amnon; Lee, Reginald; Xu, Yuanjian; and Painter, Oskar, to California Institute of Technology. Semiconductor device with electrostatic control. 6,040,590, Cl. 257-94.000.
O' Brien, Patrick Lee: *See*—
Nims, Robert A.; O'Brien, Patrick Lee; and Emerson, Terrence, 6,040,635, Cl. 290-52.000.
O' Brien, Timothy: *See*—
Compadre, Cesar; Breen, Philip; Salari, Hamid; Fifer, E. Kim; Lattin, Danny L.; Slavik, Michael; Li, Yanbin; and O'Brien, Timothy, 6,039,992, Cl. 426-332.000.
Occidental Chemical Corporation: *See*—
Hichri, Habib; Lesins, Viesturs; and Sommer, Christopher C., 6,040,477, Cl. 562-46.000.
OCE-Nederland B.V.: *See*—
van Eekhout, Mike Paul; Klerken, Pierre Antonius Marie; and Quirijnen, Robertus Petrus Cornelis, 6,040,847, Cl. 347-151.000.
Oclassen Pharmaceuticals, Inc.: *See*—
Adair, Dennis W.; Johnson, Karl M.; and Kern, Earl R., 6,040,298, Cl. 514-50.000.
Oda, Hidekazu: *See*—
Shimizu, Satoshi; and Oda, Hidekazu, 6,040,629, Cl. 257-770.000.
Oda, Kozo: *See*—
Yoshida, Akira; Oda, Kozo; Kasai, Takashi; Shimada, Kousei; Kogen, Hiroshi; Hayakawa, Ichiro; Ishihara, Sadao; Koga, Teiichiro; Kitazawa, Eiichi; and Tokui, Taro, 6,040,339, Cl. 514-485.000.
Oda, Shigeru; and Kawabata, Eiji, to Sanko Kaihatsu Kagaku Kenkyusho. Sulfonyl compound and thermalsensitive recording medium using the same. 6,040,470, Cl. 558-58.000.
Odashima, Hisao; Takahashi, Tomomi; and Shimizu, Toshiyuki, to Toyo Boseki Kabushiki Kaisha. Chromium-free, metal surface-treating composition and surface-treated metal sheet. 6,040,054, Cl. 428-413.000.
Odenthal, Heinz F., to SIG Pack Systems AG. Method of closing and sealing cardboard boxes. 6,038,837, Cl. 53-484.000.
ODME International B.V.: *See*—
de Boer, Jacob; Hamming, Martin; and Goudsmits, Petrus J. M., 6,039,172, Cl. 198-750.100.
O' Donovan, Tim; and Fenelon, Don, to McKenzie Forest Products. Inc. Apparatus and method for drilling holes in dimensional lumber. 6,039,514, Cl. 408-1.00R.
Ofcharsky, John: *See*—
Larson, John A.; Gretz, Thomas J.; and Ofcharsky, John, 6,038,821, Cl. 52-97.000.
Ofer, Erez: *See*—
Halligan, Kenneth A.; and Ofer, Erez, 6,041,394, Cl. 711-166.000.

Oga, Toshikazu: *See*—
Koguro, Kiyoto; Oga, Toshikazu; Tokunaga, Norihito; Mitsui, Sunao; and Orita, Ryozo, 6,040,454, Cl. 548-253.000.
Ogawa, Katsuhide: *See*—
Tomikawa, Ichiro; Soga, Mitsuhide; Fujii, Katsuyuki; Ogawa, Katsuhide; Yoshida, Junichi; Kawachi, Shigeo; and Noda, Takehiko, 6,039,441, Cl. 347-86.000.
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Ogawa, Makoto: *See*—
Yamada, Chuji; Kobayashi, Shin; Ogawa, Makoto; Kuwahara, Tohru; and Okumura, Eiji, 6,039,157, Cl. 188-158.000.
Ogawa, Takashi: *See*—
Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.
Ogawa, Yoji: *See*—
Inoue, Soichi; Higashikawa, Iwao; Ogawa, Yoji; Hara, Shigehiro; and Yamamoto, Kazuko, 6,040,114, Cl. 430-296.000.
Ogawa, Yuji; Abe, Yasuo; and Inoue, Tamotsu, to Denso Corporation. Method for cutting tube. 6,038,950, Cl. 83-54.000.
Ogawa, Yuri: *See*—
Kojima, Hiroyuki; Ogawa, Yuri; Kawamura, Kazue; and Sano, Konosuke, 6,040,160, Cl. 435-115.000.
Ogden, Steven D.: *See*—
Gontarski, Christopher J.; Ogden, Steven D.; and Gannon, John J., Jr., 6,039,106, Cl. 160-201.000.
Ogi, Hirotsugu: *See*—
Ohtani, Toshihiro; Ogi, Hirotsugu; and Hirao, Masahiko, 6,038,925, Cl. 73-598.000.
Ogino, Etsuo: *See*—
Anzaki, Toshiaki; and Ogino, Etsuo, 6,040,056, Cl. 428-432.000.
Oguchi, Wataru, to Alps Electric Co., Ltd. IC card connector device. 6,039,587, Cl. 439-159.000.
Ogura, Takashi; and Murata, Kousaku, to Matsushita Electric Industrial Co., Ltd. Diaphragm-edge integral moldings for speakers, acoustic transducers comprising same and method for fabricating same. 6,039,145, Cl. 181-167.000.
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Oh, Min-Jung, to Daewoo Electronics Co., Ltd. Refrigerator having a device for generating an air curtain. 6,038,880, Cl. 62-408.000.
Oh, Won Zin; Lee, Kune Woo; Choi, Wang Kyu; Park, Hyun Soo; Kim, Jong Seung; Cho, Moon Hwan; and Kim, Jong Kook, to Korea Atomic Energy Research Institute; and Korea Electric Power Corporation. Calix[4]arene dibenzo crown ethers, their preparation process and their use for the selective extraction of cesium ion. 6,040,462, Cl. 549-352.000.
Oh-e, Masahito: *See*—
Ota, Masuyuki; Kawachi, Genshiro; Kitajima, Masaaki; Sasaki, Tohru; Oh-e, Masahito; Kondo, Katsumi; and Tsumura, Makoto, 6,040,886, Cl. 349-141.000.
O' Herron, Michael R.; Loebach, John A.; and Whitehead, Greg A., to QuesTech Packaging, Inc. Liquidating Trust. Automated testing apparatus and method, especially for flexible walled containers. 6,038,915, Cl. 73-49.300.
Ohga, Manabu, to Canon Kabushiki Kaisha. Image processing apparatus and method. 6,041,136, Cl. 382-162.000.
Ohga, Norio; and Ukita, Yoshitaka, to Sony Corporation. Data disk including supplementary information enabling retrieval of related information from another storage medium. 6,041,025, Cl. 369-30.000.
Ohio State University, The: *See*—
Rapp, Robert A., 6,039,862, Cl. 205-386.000.
Stevens, Vernon C., 6,039,948, Cl. 424-184.100.
Ohira, Tadashi; Sato, Yoshiaki; and Kodama, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Fabrication method for housing structure for projection type television receivers. 6,039,912, Cl. 264-328.100.
Öhlin, Kenth; and Danek, Magnus, to Yamaha Hatsudoki Kabushiki Kaisha; and Öhlins Racing AB. Shock absorber arrangement and use. 6,039,159, Cl. 188-322.150.
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Öhlin, Kenth; and Danek, Magnus, 6,039,159, Cl. 188-322.150.
Ohmann, Anders: *See*—
Lassen, Soren Flensted; Bech, Lisbeth; Ohmann, Anders; Breinholt, Jens; Fuglsang, Claus Crone; and Ostergaard, Peter Rahbek, 6,039,942, Cl. 424-94.600.
Ohmi, Tadahiro; Yamaji, Michio; Shinohara, Tsutomu; Itoi, Shigeru; Hirao, Keiji; Kawano, Yuji; Tanaka, Shigeaki; Yokoyama, Kosuke; Morokoshi, Hiroshi; and Ikeda, Nobukazu, to Ohmi, Tadahiro; and Fujikin Incorporated. Couplings for fluid controllers. 6,039,360, Cl. 285-61.000.
Ohmi, Tadahiro; and Nitta, Takahisa, to Tadahiro Ohmi; and Kabushiki Kaiha Ultraclean Technology Research Institute. Cleaning method utilizing degassed cleaning liquid with applied ultrasonics. 6,039,814, Cl. 134-1.000.
Ohmi, Takao, to Kabushiki Kaisha Toshiba. Optical disk recording/reproducing device with eccentric and incline chuck control. 6,041,030, Cl. 369-54.000.
Ohmuro, Katsufumi: *See*—
Koike, Yoshio; Ohmuro, Katsufumi; Sasaki, Takahiro; and Takeda, Arihiro, 6,040,885, Cl. 349-129.000.
Ohnishi, Keizo: *See*—
Nishimura, Masaharu; Ohnishi, Keizo; Yasuda, Chiaki; Kajii, Shinichiro; Patrick, William P.; and Zander, Anthony C., 6,041,125, Cl. 381-71.400.
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Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Simple wide-angle zoom lens. 6,040,949, Cl. 359-689.000.
Ohno, Kenichi: *See*—
Mitsuhashi, Masashige; Ohno, Kenichi; and Yoshida, Kenichi, 6,039,635, Cl. 451-72.000.
Ohno, Manabu; Ohtake, Takeshi; Matsunaga, Satoshi; and Doujo, Tadashi, to Canon Kabushiki Kaisha. Toner for developing electrostatic image and image forming method. 6,040,103, Cl. 430-110.000.
Ohno, Motoyasu: *See*—
Umeda, Takashi; and Ohno, Motoyasu, 6,040,922, Cl. 358-468.000.
Ohnuma, Shinichi: *See*—
Narita, Keishi; Ishida, Chika; Takeuchi, Yoshie; Ohto, Chikara; Ohnuma, Shinichi; and Nishino, Tokuzo, 6,040,165, Cl. 435-193.000.
Ohsaki, Kozo: *See*—
Michiki, Hideyuki; Miyakawa, Hisashi; and Ohsaki, Kozo, 6,041,272, Cl. 700-266.000.
Ohsaki, Yoshinori: *See*—
Hasegawa, Masanobu; Yoshii, Minoru; and Ohsaki, Yoshinori, 6,040,909, Cl. 356-375.000.
Ohsato, Kiyoshi: *See*—
Ichimura, Isao; Maeda, Fumisada; Yamamoto, Kenji; Ohsato, Kiyoshi; Watanabe, Toshio; and Suzuki, Akira, 6,041,031, Cl. 369-112.000.
Ohsawa, Hirokazu: *See*—
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 6,040,449, Cl. 546-193.000.
Ohsawa, Mika: *See*—
Marutani, Yoshiaki; Tomita, Takashi; Nakahama, Tadamitsu; Uemura, Hiroyuki; Koga, Kazuhi; and Ohsawa, Mika, 6,040,009, Cl. 427-241.000.
Ohshima, Shigeru: *See*—
Ogusu, Masahiro; Tomioka, Tazuko; and Ohshima, Shigeru, 6,040,934, Cl. 359-152.000.
Ohshita, Ryuji: *See*—
Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji; Fujimoto, Masahisa; Nohma, Toshiyuki; and Nishio, Koji, 6,040,090, Cl. 429-231.950.
Ohsuga, Minoru: *See*—
Shiraishi, Takuya; Nogi, Toshiharu; Ohsuga, Minoru; Nakayama, Yoko; and Tokuyasu, Noboru, 6,039,026, Cl. 123-399.000.
Ohtake, Takeshi: *See*—
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Ohtani, Toshihiro; Ogi, Hirotsugu; and Hirao, Masahiko, to Ebara Corporation. Focal type electromagnetic acoustic transducer and flaw detection system and method. 6,038,925, Cl. 73-598.000.
Ohto, Chikara: *See*—
Narita, Keishi; Ishida, Chika; Takeuchi, Yoshie; Ohto, Chikara; Ohnuma, Shinichi; and Nishino, Tokuzo, 6,040,165, Cl. 435-193.000.
Ohtomo, Fumio; Nakata, Yuji; Fukuyama, Yoshitaka; Inomata, Asako; Shibuya, Sachio; Koga, Akinori; Ishii, Junji; Ito, Shoko; and Yamamoto, Hironobu, to Kabushiki Kaisha Toshiba. Combined cycle power plant. 6,038,850, Cl. 60-39.182.
Ohtorii, Hiizu: *See*—
Sato, Shuzo; and Ohtorii, Hiizu, 6,039,631, Cl. 451-37.000.
Ohura, Hitoshi: *See*—
Shiina, Kazuhiro; Kawamoto, Koji; Miura, Masato; Ohura, Hitoshi; Ozeki, Shoichi; Akiyama, Noboru; Nunomura, Kunihoro; Nemoto, Minehiro; and Iwamura, Masahiro, 6,040,827, Cl. 345-208.000.
Ohwaki, Kenji: *See*—
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, 6,040,449, Cl. 546-193.000.
Oikawa, Takeya: *See*—
Yamane, Kazuyasu; Oikawa, Takeya; and Niimi, Tomohiro, 6,041,244, Cl. 455-575.000.
Oil-Dri Corporation of America: *See*—
Goss, G. Robert; and Soral, Robert, 6,039,004, Cl. 119-172.000.
Oishi, Yasuyuki: *See*—
Fukumasa, Hidenobu; Oishi, Yasuyuki; Nagatani, Kazuo; and Hamada, Hajime, 6,041,034, Cl. 370-203.000.
Oji Paper Co., Ltd.: *See*—
Ootuka, Minoru; Hiraoka, Hirokazu; Shimadu, Toru; and Noda, Masayuki, 6,040,252, Cl. 442-169.000.
Oka, Shogo: *See*—
Kawasaki, Toshisuke; and Oka, Shogo, 6,040,156, Cl. 435-69.100.
Okabe, Michio: *See*—
Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, 6,039,919, Cl. 420-446.000.
Okabe, Takanori; Ban, Takashi; Suzuki, Shigeru; and Hirose, Tatsuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Viscous fluid type heat generator. 6,039,264, Cl. 237-12.30R.
Okabe, Takanori: *See*—
Ban, Takashi; Hoshino, Tatsuyuki; Okabe, Takanori; and Ban, Takahisa, 6,039,007, Cl. 122-26.000.
Okabe, Yasushi: *See*—

Suzuki, Tsutomu; Sato, Shougo; and Okabe, Yasushi, 6,041,203, Cl. 399-111.000.

Okada, Kesao; and Kurose, Shigeo, to TDK Corporation. Lapping tape. 6,040,034, Cl. 428-143.000.

Okada, Masakatsu: *See*—
Sekijima, Takenori; Fujii, Takashi; Wakino, Kikuo; and Okada, Masakatsu, 6,039,802, Cl. 117-49.000.

Okada, Mitsuharu, to Mita Industrial Co., Ltd. Toner replenishing device of image forming machine and toner cartridge for use therein. 6,041,212, Cl. 399-359.000.

Okada, Noboru, to Yokohama Rubber Co., Ltd., The. Method of forming green tire with strip winding. 6,039,826, Cl. 156-117.000.

Okamoto, Akihiko; and Ito, Fuminori, to NEC Corporaiton. Method of driving a field emission cold cathode device and a field emission cold cathode electron gun. 6,040,973, Cl. 361-235.000.

Okamoto, Hiroo; Hosokawa, Kyoichi; Owashi, Hitoaki; Tachibana, Hiroaki; and Noguchi, Takaharu, to Hitachi, Ltd. Input-output circuit, recording apparatus and reproduction apparatus for digital video signal. 6,041,161, Cl. 386-112.000.

Okamoto, Karlton K.: *See*—
Jones, John J.; Saggio, Rosario S.; Okamoto, Karlton K.; and Lenoil, Isidor, 6,039,519, Cl. 410-69.000.

Okamoto, Masakazu; and Kurihara, Toshiyuki, to Daikin Industries, Ltd. Cryogenic refrigerating machine and control method therefor. 6,038,866, Cl. 62-6.000.

Okamoto, Takafumi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel cell. 6,040,073, Cl. 429-26.000.

Okamura, Takumi: *See*—
Bando, Yumi; Okamura, Takumi; and Murata, Toshinori, 6,040,867, Cl. 348-423.000.

Okano, Masayuki: *See*—
Terai, Tadayoshi; Hitomi, Yoshinori; Okano, Masayuki; and Kinoshita, Kazutoshi, 6,038,728, Cl. 15-250.201.

Okawachi, Kiyoshi: *See*—
Nagashima, Tomotaka; Okabe, Michio; Noda, Toshiharu; and Okawachi, Kiyoshi, 6,039,919, Cl. 420-446.000.

Okazaki, Masaomi: *See*—
Shimoi, Yoichi; Tamura, Hideo; Okazaki, Masaomi; and Suganuma, Takao, 6,039,879, Cl. 210-641.000.

Oketani, Tetsuya; and Uemura, Tadashi, to Howa Machinery, Ltd. Tool changing mechanism. 6,039,680, Cl. 483-57.000.

Oki Data Corporation: *See*—
Kobayashi, Hideyuki; Kishimoto, Mitsuru; Ooishi, Noboru; and Ikeda, Kiyoshi, 6,039,433, Cl. 347-40.000.

Oki Electric Industry Co., Ltd.: *See*—
O, Waho; and Katsuyama, Tsutomu, 6,041,081, Cl. 375-297.000.
Sato, Hisatake, 6,040,723, Cl. 327-144.000.
Yokomizo, Koichi, 6,041,089, Cl. 375-371.000.

Okido, Yoshiyuki: *See*—
Tanaka, Hiroaki; Okido, Yoshiyuki; and Sano, Hideki, 6,039,910, Cl. 264-248.000.

Okino, Hirohito: *See*—
Ichioka, Ryoji; Yamakawa, Shinobu; Okino, Hirohito; Kato, Hajime; Iwayama, Kazuyoshi; Konta, Hiroshi; and Kitamura, Akira, 6,040,490, Cl. 585-475.000.

Okita, Tomoaki; Nakashima, Katsumi; Mizushima, Takashi; and Wadaki, Takeru, to Toyoda Gosei Co. Ltd. Foam rubber composition and a molded product of foam rubber. 6,040,351, Cl. 521-140.000.

Okiura, Tomoo: *See*—
Sota, Akio; Okiura, Tomoo; and Azuma, Masaki, 6,039,782, Cl. 71-10.000.

Okmetic Ltd.: *See*—
Ellison, Alex; Kordina, Olle; Gu, Chun-Yuan; Hallin, Christer; Janzen, Erik; and Tuominen, Marko, 6,039,812, Cl. 118-725.000.

Oksanen, Markku Tapio; Peranto, Juha; and Vuorio, Martti Ensio, to Nokia Mobile Phones Limited. Method and apparatus for registering a radio telephone subscriber unit wherein the subscriber unit remains tuned to the registering channel after successful registration. 6,041,234, Cl. 455-434.000.

Okubo, Hiromi; and Ishii, Rie, to Ricoh Company, Ltd. Image processing apparatus. 6,041,139, Cl. 382-199.000.

Okuda, Akihito; Fushimi, Koichi; and Terayama, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic and mechanical transmission apparatus. 6,039,666, Cl. 475-72.000.

Okuda, Mitsuhiro: *See*—
Terada, Akihiro; and Okuda, Mitsuhiro, 6,040,554, Cl. 219-124.340.

Okuma, Kazuyoshi: *See*—
Yamato, Seiichi; Kamei, Noboru; Okuma, Kazuyoshi; Sugawa, Katsumi; Kadota, Hironori; and Sakata, Tomoyuki, 6,041,062, Cl. 370-465.000.

Okumura, Daisuke: *See*—
Kushiya, Katsumi; Okumura, Daisuke; and Sugiyama, Ichiro, 6,040,521, Cl. 136-265.000.

Okumura, Eiji: *See*—
Yamada, Chuji; Kobayashi, Shin; Ogawa, Makoto; Kuwahara, Tohru; and Okumura, Eiji, 6,039,157, Cl. 188-158.000.

Okumura, Yoichiro; Nagai, Michio; Terada, Hiroshi; and Maruyama, Atsushi, to Olympus Optical Co., Ltd. Power transmission apparatus. 6,041,187, Cl. 396-132.000.

Olarig, Sompong Paul: *See*—
Mayer, Dale J.; Olarig, Sompong Paul; Whiteman, William F.; and Heinrich, David F., 6,041,377, Cl. 710-113.000.

Olerud, Sven. Method and a device for implant locking. 6,039,740, Cl. 606-72.000.

Olicom A/S: *See*—
Povlsen, Lars; Skjoldborg, Erling; and Goldman, Tomasz Jerzy, 6,041,063, Cl. 370-465.000.

Olin Corporation: *See*—
Harris, Melvin Ward; and Mayfield, Scott Hayward, 6,038,978, Cl. 102-467.000.

Olin Microelectronic Chemicals, Inc.: *See*—
Blakeney, Andrew J.; Medina, Arturo N.; Toukhy, Medhat A.; Ferreira, Lawrence; Jeffries, Alfred T., III; and Naiini, Ahmad A., 6,040,107, Cl. 430-165.000.

Olin, Wesley L.: *See*—
Fox, Richard H.; Steinbacher, David M.; Olin, Wesley L.; Meyers, Vernon O.; and Zimmerle, William J., 6,039,158, Cl. 188-162.000.

Oliver, Richard Joseph: *See*—
Claar, Jeffrey Mark; Duvall, Roger Mather; and Oliver, Richard Joseph, 6,041,407, Cl. 713-1.000.

Olivier, Helene; Commereuc, Dominique; and Drochon, Sebastien, to Institut Francais du Petrole. Process for hydroformylating olefins. 6,040,483, Cl. 568-454.000.

Olivier, Helene: *See*—
Mussmann, Lothar; Chauvin, Yves; and Olivier, Helene, 6,040,263, Cl. 502-164.000.

Olkkola, Jari, to Nokia Mobile Phones Limited. Installation and assembly holding mat for a telephone. 6,041,120, Cl. 379-433.000.

Olofsson, Erik: *See*—
Markström, Lars; Zander, Lennarth; Olofsson, Erik; and Norblad, Olof, 6,038,855, Cl. 60-323.000.

Olsen, Uffe Bang: *See*—
Andersen, Knud Erik; Jørgensen, Tine Krogh; Hohlweg, Rolf; Fischer, Erik; Olsen, Uffe Bang; Polivka, Zdenek; Sindelar, Karel; and Valenta, Vladimir, 6,040,318, Cl. 514-329.000.

Olson, Wayne C.: *See*—
Bhatt, Sanjiv M.; Eggum, Shawn D.; and Olson, Wayne C., 6,039,186, Cl. 206-711.000.

Olstad, Marvel: *See*—
Olstad, Todd; and Olstad, Marvel, 6,039,202, Cl. 220-533.000.

Olstad, Todd; and Olstad, Marvel. Cooler insert system. 6,039,202, Cl. 220-533.000.

Oltman, John Edward: *See*—
Adey, Robert; Dopp, Robert Brian; and Oltman, John Edward, 6,040,074, Cl. 429-27.000.

Olympus Optical Co., Ltd.: *See*—
Aoki, Norihiko, 6,041,193, Cl. 396-379.000.
Ichikawa, Yoshito; Mihori, Takashi; Sakurai, Tomohisa; and Honda, Yoshitaka, 6,039,732, Cl. 606-38.000.
Katagiri, Moriya; Sugita, Yukihiko; and Kitahara, Yoshiyuki, 6,039,476, Cl. 396-418.000.
Kawasaki, Kenji, 6,040,940, Cl. 359-389.000.
Kimura, Kenichi; Shiga, Akira; Hashiguchi, Toshihiko; Murakami, Eiji; and Sasaki, Katsumi, 6,039,752, Cl. 606-205.000.
Okumura, Yoichiro; Nagai, Michio; Terada, Hiroshi; and Maruyama, Atsushi, 6,041,187, Cl. 396-132.000.
Ono, Katsuya; Shiraiwa, Masaru; and Nishioka, Kimihiko, 6,041,154, Cl. 385-116.000.
Suzuki, Tatsuya, 6,041,185, Cl. 396-56.000.

Olzak, Richard A., to AlliedSignal. Access panel retention device. 6,040,526, Cl. 174-52.100.

Oman, Price Ward: *See*—
Bass, Brian Mitchell; Hubbard, James Allison; Oman, Price Ward; and Pita, Frank J., 6,041,375, Cl. 710-103.000.

Omni International, Inc.: *See*—
Thomas, Jackie K., 6,039,418, Cl. 312-258.000.

Omni Manufacturing, Inc.: *See*—
Sanduja, Mohan L.; Horowitz, Carl; Kamruzzaman, Mohammed; Thottathil, Paul; and Ramsey, Earl A., 6,039,964, Cl. 424-404.000.

Omnicell Technologies, Inc.: *See*—
Holmes, William K., 6,039,467, Cl. 364-479.010.

Omnipoint Corporation: *See*—
Scott, Logan; and Williams, Claude M., 6,041,046, Cl. 370-319.000.

OMS Investments, Inc.: *See*—
Goertz, Harvey M.; Timmons, Richard J.; and Johnson, William R., 6,039,781, Cl. 71-1.000.

O' Neal, Timothy L., to Intex Exhibits International, L.L.C. Light bracket. 6,039,457, Cl. 362-217.000.

OneClip.com, Incorporated: *See*—
Laor, Raviv, 6,041,309, Cl. 705-14.000.

O' Neil, Keith C.: *See*—
Long, David C.; Moyer, Thomas P.; O'Neil, Keith C.; Perry, Charles H.; Pomerantz, Glenn A.; Case, James R.; Kando, Laszlo; and Kozol, John E., 6,038,931, Cl. 73-850.000.

O' Neill, Cormac G., to Kinetic Ceramics, Inc. Piezoelectric positioner. 6,040,653, Cl. 310-328.000.

Onishi, Hitoshi: *See*—
Ishida, Tatsuyoshi; Yasuda, Masaaki; Onishi, Hitoshi; Kihara, Noriaki; Tsutsui, Toshiyuki; Sagane, Toshihiro; Kawasaki, Masaaki; and Nakahama, Hidenari, 6,040,407, Cl. 526-281.000.

Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, to Shinko Electric Co., Ltd. Positional deviation detecting device for a mobile body and position correcting apparatus for a working machine mounted on a mobile body. 6,041,274, Cl. 701-26.000.

Ono, Haruo: *See—*
Takahashi, Kazuhiro; Kobayashi, Toshitake; Takemoto, Masataka; Matano, Takashi; and Ono, Haruo, 6,040,044, Cl. 428-323.000.

Ono, Katsuya; Shiraiwa, Masaru; and Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Image fiber and method of fabricating the same. 6,041,154, Cl. 385-116.000.

Ono, Kazuya, to Nikon Corporation. Supporting apparatus using magnetic power. 6,040,675, Cl. 318-649.000.

Onoda, Naka, to NEC Corporation. Electron beam exposure method using a moving stage. 6,040,583, Cl. 250-492.220.

Onodera, Masahiro: *See—*
Haneda, Satoshi; Tokimatsu, Hiroyuki; Onodera, Masahiro; and Hamada, Shuta, 6,041,204, Cl. 399-159.000.

Onozuka, Toshihiko: *See—*
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.

Onuma, Hiraku: *See—*
Hara, Akira; Onuma, Hiraku; Oyaizu, Hideo; Suzuki, Yuuichi; and Gasparrini, C. Robert, 6,038,731, Cl. 15-256.510.

Ooishi, Noboru: *See—*
Kobayashi, Hideyuki; Kishimoto, Mitsuru; Ooishi, Noboru; and Ikeda, Kiyoshi, 6,039,433, Cl. 347-40.000.

Oom, Jan: *See—*
Niska, Håkan; Kvarnström, Bo; and Oom, Jan, 6,041,228, Cl. 455-419.000.

Oono, Masahiro; Iwanade, Hisao; Saitoh, Noboru; Sato, Koji; Shiba, Sukenori; Yoshida, Tatsuya; and Nagai, Nobuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for driving stepper motor of camera. 6,040,677, Cl. 318-696.000.

Oota, Tsutomu: *See—*
Shirai, Kenji; Yokoyama, Seiya; and Oota, Tsutomu, 6,040,665, Cl. 318-14.000.

Ootuka, Minoru; Hiraoka, Hirokazu; Shimadu, Toru; and Noda, Masayuki, to Shin-Kobe Electric Machinery Co.; Teijin Limited; and Oji Paper Co., Ltd. Laminate base material, a method of producing the same, a prepreg and a laminate. 6,040,252, Cl. 442-169.000.

Oowaki, Yukihito: *See—*
Noguchi, Mitsuhiro; and Oowaki, Yukihito, 6,040,610, Cl. 257-392.000.

Opfer, John C.: *See—*
French, Thomas G.; Guio, Raphael H.; Kowalyshen, Henry W.; McGlone, Buddy B.; Mears, Gregory C.; and Opfer, John C., 6,040,538, Cl. 200-293.000.

Oprea, Florin I. Side rearview mirror device. 6,039,448, Cl. 359-850.000.

Optimize Incorporated: *See—*
Hebert, Raymond T., 6,040,946, Cl. 359-630.000.

Oracle Corporation: *See—*
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Tsukerman, Alex, 6,041,423, Cl. 714-19.000.
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Imoto, Kazunobu; Oshima, Katsuyuki; and Nishikawa, Hideki, 6,040,269, Cl. 503-227.000.

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Cutler, Stanley; Gerth, Gayle B.; Otis, Alton B., Jr.; and Chau, Taylor, 6,039,702, Cl. 601-15.000.

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Hultholm, Stig-Erik; and Fugleberg, Sigmund Peder, 6,039,790, Cl. 75-739.000.

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Flynn, Robin L.; Hayes, Dan M.; and Nickey, George A., 6,038,888, Cl. 65-304.000.

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Konefal, Robert S.; and Vander, Noel T., 6,039,195, Cl. 215-209.000.

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Smith, Roy E., 6,040,003, Cl. 427-177.000.

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Wolfe, Steven R.; and Mierzwiak, James G., 6,039,198, Cl. 215-228.000.

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Tailhan-Lomont, Catherine; Erdelmeier, Irène; Moutet, Marc; Chaudiere, Jean; and Yadan, Jean-Claude, 6,040,328, Cl. 514-398.000.

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Jessup, James Lyle; and Paalman, Donald Henry, 6,039,716, Cl. 604-385.100.

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Peifer, Bernd; Palackal, Syriac J.; Welch, M. Bruce; Alt, Helmut G.; and Schertl, Peter, 6,040,402, Cl. 526-160.000.

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Zuppa, Riccardo, 6,039,594, Cl. 439-318.000.

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Wu, Xiaosong; Shertok, Joel; and Konstantin, Peter, 6,039,872, Cl. 210-500.350.

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LaLange, Jacques; and Pamart, Olivier, 6,039,589, Cl. 439-188.000.

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Kostka, Stanley J.; and Pan, Rennan, 6,039,966, Cl. 424-405.000.

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Shah, Sunil C.; Pandey, Pradeep; and Erickson, Mark A., 6,041,172, Cl. 395-500.270.

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Ransil, Matthew J.; and Pangborn, Donald R., 6,038,986, Cl. 108-145.000.

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Bertola, Aldo; and Cassarino, Salvatore, 6,040,460, Cl. 549-262.000.

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Delwiche, Christopher; Bero, Joseph; and Ginnow, Gregory, 6,038,972, Cl. 101-216.000.

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Finsterwald, P. Michael; Douglas, Stephen Joseph; and Just, Ricky Gail, 6,038,752, Cl. 29-25.350.

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Park, Edward H.; and Sweeney, Philip, to Gillette Canada Company. Dental floss. 6,039,054, Cl. 132-321.000.

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Demiryont, Hüyla; Parlar, Hüseyin; Ersoy, Ayse; and Aktulga, Ender, 6,040,939, Cl. 359-360.000.

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Lueck, Dale E.; and Parrish, Clyde F., 6,039,783, Cl. 71-59.000.

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Paterson, Robert Ian; and Sweeney, Patrick John, to Helifix Limited. Wall tie reinforcement and method. 6,039,125, Cl. 173-1.000.

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Bickerton, Matthew John; Bohrer, Kathryn Ann; Hughes, Emma Suzanne; Kenworthy, Edward William; Musgrove, Rupert Jeremy; Patterson, LindaMay Rose; Porter, Steven; Salt, David Dennis; and Scattergood, Duncan Keith, 6,041,312, Cl. 705-30.000.

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Kurmis, Viktor, 6,039,089, Cl. 140-93.200.

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Schuster, Johann, 6,040,644, Cl. 310-43.000.

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Pearce, Jerry W. Casing board including clear overlay defining exterior pocket. 6,039,494, Cl. 402-73.000.

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Binns, Bruce W.; Price, Rodney M.; Palm, Charles S.; and Weaver, Suzanne E., 6,041,140, Cl. 382-209.000.
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Walker, Jay S.; Case, T. Scott; Hartmann, Tracy; and Tedesco, Daniel E., 6,041,308, Cl. 705-14.000.
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Lang, Feng, 6,038,876, Cl. 62-238.400.
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Pierce, Michael E.; Chen, Cheng Y.; Choudhury, Anusuya; Radesca, Lilian A.; Tan, Lushi; and Zhao, Dalian, 6,040,480, Cl. 564-390.000.

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Kooy, Hanne M.; Hacker, Fred L.; and Bellerive, Marc R., 6,041,101, Cl. 378-147.000.

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Mendlovic, David; and Marom, Dan M., 6,041,151, Cl. 385-16.000.

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Cherry, James R.; and Raynus, Abel, 6,040,765, Cl. 340-436.000.

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Chen, Ricky Y.; Linder, Lloyd F.; Devendorf, Don C.; and Gorder, Matthew S., 6,040,731, Cl. 327-359.000.
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Carpino, Louis A.; and El-Faham, Ayman Ahmed, 6,040,422, Cl. 530-333.000.

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Donlan, Rodney M.; Elliot, David L.; Kapp, Nancy J.; Wiatr, Christopher L.; and Rey, Paul A., 6,039,965, Cl. 424-405.000.

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Kim, Derek; and Lopez, Thomas, 6,039,585, Cl. 439-137.000.

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Manz, Herbert; Tuncer, Haluk; and Zaeper, Manfred, 6,040,551, Cl. 219-121.650.

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Chambost, Bernard; Marion, Philippe; and Mathieu, Corinne, 6,040,481, Cl. 564-422.000.
Costantini, Michel; Gilbert, Laurent; and Spagnol, Michel, 6,040,484, Cl. 568-803.000.

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Popoff, Christine; Nartey, Alwyn; Gabriel, Robert; and Aubay, Eric, 6,040,288, Cl. 510-466.000.

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Hostettler, Fritz; Rhum, David; Forman, Michael R.; Helmus, Michael N.; and Ding, Ni, 6,040,058, Cl. 428-457.000.

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Takehara, Nobuyuki; Shimoda, Kazuhisa; and Morishita, Yasuo, 6,038,771, Cl. 29-897.200.

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Sakamoto, Yoshiaki, 6,040,517, Cl. 84-713.000.

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Lazo, John S.; Rice, Robert L.; Cunningham, April; and Wipf, Peter, 6,040,323, Cl. 514-374.000.

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Guinn, Robert; and Richards, David, 6,039,648, Cl. 463-16.000.

Richards, John S., to Heidelberger Druckmaschinen AG. Gripper deceleration cross folder. 6,038,974, Cl. 101-232.000.

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Lee, William Robert; and Richardson, Leland Duane, 6,040,725, Cl. 327-175.000.

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Kennie, Jerry; Cheng, Yi; Hope, Mark E.; Huff, Shean; Nankee, Robert J., II; Joyce, Mary; Krozek, Dennis A.; Moote, Richard K.; Richardson, Roland T.; Rotramel, William D.; and Seitz, Gary L., 6,041,278, Cl. 701-103.000.

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Hayafune, Takeshi; Maemura, Kouichiro; and Miura, Takahito, 6,041,183, Cl. 395-712.000.
Nakamura, Masaru, 6,041,074, Cl. 375-200.000.
Nishida, Hirobumi, 6,041,138, Cl. 382-197.000.
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Riesland, David Henrik: *See—*
Hopkins, William Thomas; Riesland, David Henrik; and Banks, Anthony William, 6,040,778, Cl. 340-650.000.

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Fleischhauer, Grier S.; Higgins, Charles T.; Losee, D. Bruce; Nelson, J. Robert, Jr.; Ripley, Robert L.; Sano, Masato; Sharpe, David E.; and Watkins, Michael L., 6,040,560, Cl. 219-494.000.

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Chevallet, Jacques; and Riquier, Jean-Claude, 6,039,877, Cl. 210-636.000.

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Hara, Yoshikazu; Motoe, Katsuro; and Sanagi, Hisashi, 6,038,968, Cl. 101-116.000.

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Weckstrom, Kurt P.; and Ristolainen, Kimmo J., 6,041,247, Cl. 600-323.000.

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Besserer, Horst; Hartel, Marc; and Zachrai, Jürgen, 6,039,420, Cl. 312-265.100.

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Redei, Eva; Aird, Fraser; Rittenhouse, Peter A.; and McGivern, Robert F., 6,039,956, Cl. 424-198.100.

Rivard, Germain Francois: *See—*
Klemm, William Robert; and Rivard, Germain Francois, 6,039,923, Cl. 422-61.000.

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Lizzi, Frederic, 6,039,689, Cl. 600-439.000.

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Buck, Manfred; Brost, Wolfgang; Handschuh, Robert; and Kratt, Helmut, 6,039,038, Cl. 125-39.000.
Fischer, Werner; and Luebbert, Birte, 6,040,721, Cl. 327-110.000.
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Hog, Norbert, 6,040,669, Cl. 318-480.000.
Pfaff, Georg; and Keller, Herbert, 6,040,779, Cl. 340-661.000.
Pfaundler, Julian, 6,039,639, Cl. 451-356.000.
Posselt, Andreas; and Koehler, Christian, 6,039,021, Cl. 123-306.000.
Reiter, Ferdinand, 6,039,271, Cl. 239-585.400.
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Takamatsu, Risuke; and Kimura, Seiichi, 6,039,300, Cl. 251-129.120.
Weyl, Helmut; and Wild, Bernhard, 6,039,856, Cl. 204-400.000.

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Demoise, Thomas Edwin, Jr., 6,039,155, Cl. 188-73.390.
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Dvorak, Charles A.; Wren, Douglas L.; Fisher, Lawrence E.; Axt, Steven D.; Humphreys, Eric R.; Arzeno, Humberto B.; Beard, Colin C.; Nguyen, Sam Linh; Han, Yeun-Kwei; Roberts, Christopher R.; Lund, Jan P.; and Fatheree, Paul R., 6,040,446, Cl. 544-276.000.

Roberts, John D.: *See—*
Carter, Thurman B.; Luke, Michael A.; and Roberts, John D., 6,039,118, Cl. 166-355.000.

Roberts, Jon L. Writing implement sterilization apparatus. 6,039,928, Cl. 422-186.300.

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Robinson, Christophe F.: *See—*
Enichen, William A.; and Robinson, Christophe F., 6,040,095, Cl. 430-5.000.

Robinson, David L.: *See—*
Whalen, John F.; and Robinson, David L., 6,039,399, Cl. 297-362.120.

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Robinson, Ross G.: *See—*
Talley, Laroul J.; Yurek, Theodore F.; Ziegler, Douglas D.; and Robinson, Ross G., 6,038,902, Cl. 72-128.000.

Robson, Michael G.: *See—*
Moore, Richard L.; Robson, Michael G.; Lockeby, Warren E., Jr.; and Kaylor, Billy E., 6,038,813, Cl. 47-75.000.

Robson, Peter: *See—*
LeFlécher, René; and Robson, Peter, 6,039,994, Cl. 426-498.000.

Roche Molecular Systems, Inc.: *See—*
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; Mullis, Kary B.; and Gelfand, David H., 6,040,166, Cl. 435-194.000.

Roche, Robert P.: *See—*
Grasso, Albert P.; Martin, Ronald G.; and Roche, Robert P., 6,039,823, Cl. 156-89.260.

Roche, Steven L., to Colorado School of Mines. Method for correcting amplitude and phase differences between time-lapse seismic surveys. 6,041,018, Cl. 367-46.000.

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Pfander, Hanspeter; and Traber, Bruno, 6,040,475, Cl. 560-264.000.

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Kelly, Timm L.; and Rochfort, Gary L., 6,040,280, Cl. 508-503.000.

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Rockow, Steven: *See—*
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Rockwell Science Center, Inc.: *See—*
Grave, Duane A., 6,039,451, Cl. 362-29.000.

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Lehrieder, Erwin Paul Josef; Röder, Klaus Walter; and Trutschel, Hartwig Horst, 6,039,284, Cl. 242-559.000.

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Himmel, Maria Azua; and Rodriguez, Herman, 6,041,360, Cl. 709-245.000.

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Albrecht, Klaus; Hoess, Werner; and Schikowsky, Hartmut, 6,040,387, Cl. 525-330.500.

Roep, Bart O.: *See*—
Madsen, Ole Dragsbaek; Michelsen, Birgitte Koch; Petersen, Jacob Steen; Roep, Bart O.; and Teisner, Borge, 6,040,134, Cl. 435-4.000.

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Lau, Willie; Kelly, Michael DeWayne; Lorah, Dennis Paul; and Heinley, David Ralph, 6,040,409, Cl. 526-328.000.
Maver, Tammy Lynne; and Krasnansky, Robert, 6,040,368, Cl. 524-110.000.

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Missel, Gregory E.; and Romano, Charles E., 6,040,060, Cl. 428-478.200.

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Romero, Dennis Mark: *See*—
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Schreck, Roman, 6,038,708, Cl. 4-244.100.

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Rose, Janna L.: *See*—
Bennett, Patricia S.; Kenyon, Kenneth H.; Ekern, Ronald J.; Rose, Janna L.; and Wieser, Josie B., 6,040,088, Cl. 429-229.000.

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Rosengren, Jürgen F.; Saeijs, Ronald W. J. J.; and Persoon, Eric H. J., to U.S. Philips Corporation. Method and apparatus for multiplexing and transmitting autonomously/intra coded pictures along with the main or I, P, B pictures/video. 6,041,068, Cl. 370-538.000.

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Brito, Joao Carlos F.; Rote, John K.; Trafton, Frederick W.; and Martins, Marcus M., 6,040,671, Cl. 318-603.000.

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Knorr, Gottfried; Rotermund, Udo; Baum, Eva; Seifert, Holger; and Wiegmann, Werner, 6,040,349, Cl. 521-131.000.

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Christiansen, John A.; and Rumbaugh, Erik, 6,039,875, Cl. 210-606.000.
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Jones, Robert Allen; Kaufman, Mark C.; and Rumpel, Manfred Carl, 6,039,351, Cl. 280-781.000.
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Kilkki, Matti Kalevi; and Ruutu, Jussi Pekka Olavi, 6,041,039, Cl. 370-230.000.
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Niederman, Robert Raymond; Starner, Allen Richard; and Ryan, Shawn Gregory, 6,039,348, Cl. 280-741.000.
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Buysse, Steven P.; Kennedy, Jenifer S.; Lands, Michael J.; Loeffler, Donald R.; Lukianow, S. Wade; and Ryan, Thomas P., 6,039,733, Cl. 606-40.000.
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Jackson, Neil A.; Williamson, John T.; Frantz, Francis J.; Ryll, Patrick B.; and Greenbaum, Hyman A., 6,041,019, Cl. 367-124.000.
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French, Thomas G.; Guio, Raphael H.; Kowalyshen, Henry W.; McGlone, Buddy B.; Mears, Gregory C.; and Opfer, John C., 6,040,538, Cl. 200-293.000.
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Huang, Chi-Jung; and Li, Ken Ming, 6,041,419, Cl. 713-401.000.
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Ishida, Tatsuyoshi; Yasuda, Masaaki; Onishi, Hitoshi; Kihara, Noriaki; Tsutsui, Toshiyuki; Sagane, Toshihiro; Kawasaki, Masaaki; and Nakahama, Hidenari, 6,040,407, Cl. 526-281.000.
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Kusunoki, Akihiko; Kawamura, Naohisa; Sugizaki, Yoshiki; and Kuwahara, Akio, 6,039,971, Cl. 424-443.000.
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Saitoh, Takahiro: *See*—
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Kuramitsu, Masayuki; Saitou, Mitsuo; Maeno, Yutaka; and Hara, Takefumi, 6,040,127, Cl. 430-567.000.
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Sakai, Motohiro: *See*—
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Sakai, Satoshi: *See*—
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Sakaue, Shigeo: *See*—
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Sakura Color Products Corporation: *See*—
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Sakurai, Tomohisa: *See*—
Ichikawa, Yoshito; Mihori, Takashi; Sakurai, Tomohisa; and Honda, Yoshitaka, 6,039,732, Cl. 606-38.000.

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Sakurai, Yasuo, to Daishin Frame Inc. Method and apparatus of controlling reservation for goods and the like. 6,041,305, Cl. 705-5.000.

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Saliba, George, to Quantum Corporation. Method and apparatus for multiple channel head assembly. 6,040,964, Cl. 360-121.000.

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Salley, Thomas F.: *See*—
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Salt, David Dennis: *See*—
Bickerton, Matthew John; Bohrer, Kathryn Ann; Hughes, Emma Suzanne; Kenworthy, Edward William; Musgrove, Rupert Jeremy; Patterson, LindaMay Rose; Porter, Steven; Salt, David Dennis; and Scattergood, Duncan Keith, 6,041,312, Cl. 705-30.000.

Salus Media Inc.: *See*—
Douglas, Peter; Dudik, Evan; Evans, John; and Kritzer, Alan, 6,039,688, Cl. 600-300.000.

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Teran, Alfredo J.; Derrick, John R., Jr.; Samad, Nidal A.; Willoughby, W. Todd; and Wood, Richard G., 6,039,874, Cl. 210-605.000.

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Fitzgerald, Eugene A.; and Samavedam, Srikanth B., 6,039,803, Cl. 117-89.000.

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Kang, Young-Cheol; Lee, Byung-Hak; and Song, Man-Ho, 6,039,619, Cl. 445-24.000.
Kim, Jin-nyun, 6,040,656, Cl. 313-481.000.

Samsung Electronics Co., Ltd.: *See*—
Chang, Sung-Hun, 6,038,788, Cl. 34-443.000.
Choi, Bong-Hwan, 6,041,208, Cl. 399-281.000.
Choi, Chang-Shik; and Park, Young-Woo, 6,040,596, Cl. 257-306.000.
Eum, Jae-yong, 6,039,663, Cl. 474-103.000.
Ham, Sang-Man, 6,039,481, Cl. 400-708.000.
Han, Youn-soo; Kim, Hyeung-ki; Kim, Hyun-joon; and Kim, Seung-un, 6,038,699, Cl. 2-69.000.
Jun, Sung-Gon, 6,040,868, Cl. 348-448.000.
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Kim, Jin-Bog, 6,040,874, Cl. 348-569.000.
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Kim, Jong-Woo, 6,041,201, Cl. 399-93.000.
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Lee, Sang-oh, 6,040,722, Cl. 327-143.000.
Lim, Chang-su; Kim, Hyeog-ki; Kim, Sue-ryeon; and Kim, Il-kyoung, 6,040,254, Cl. 442-261.000.
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Park, Chan-ho; and Park, Jae-hong, 6,040,219, Cl. 438-268.000.
Park, Dong seek, 6,040,879, Cl. 348-845.100.
Park, Jong-kwon; and Tsuneji, Anjai, 6,039,558, Cl. 425-556.000.
Park, Jong-min; and Jung, Tae-sung, 6,040,735, Cl. 327-541.000.
Park, Young-wook; Yoo, Cha-young; Kim, Young-sun; and Nam, Seung-hee, 6,039,811, Cl. 118-719.000.
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Sanada, Yoshiaki: *See*—
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Sanagi, Hisashi: *See*—
Hara, Yoshikazu; Motoe, Katsuro; and Sanagi, Hisashi, 6,038,968, Cl. 101-116.000.

Sanchez, Hector; Alvarez, Jose M.; Siegel, Joshua; and Nicoletta, Carmine, to Motorola, Inc. Digital output buffer for multiple voltage system. 6,040,729, Cl. 327-309.000.

Sanchez, Luis A.: *See*—
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Sanchez, Mauricio E.: *See*—
Alterman, Steven S.; Sanchez, Mauricio E.; and Longhurst, Audrey, 6,041,045, Cl. 370-313.000.

Sanden Corporation: *See*—
Fukushima, Eiji; and Shimizu, Shigemi, 6,038,960, Cl. 92-12.200.

Sanders, Marcus Maria; Kapitan, John Mark; and Brown, Henry John Harding, to Depuy Orthopaedics, Inc. Fastener. 6,039,738, Cl. 606-61.000.

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Srinivasan, Anand; and Sandhu, Gurtej S., 6,040,010, Cl. 427-250.000.

SanDisk Corporation: *See*—
Wallace, Robert F., 6,040,622, Cl. 257-679.000.

Sands, Matthew Richard: *See*—
Dalgleish, David Thomson; and Sands, Matthew Richard, 6,040,042, Cl. 428-308.400.

Sands, Steven L.: *See*—
Gandre, Jerry D.; Sands, Steven L.; Mills, R. Steven; and Lopez, Arthur, 6,040,982, Cl. 361-724.000.

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Wideman, Lawson Gibson; and Sandstrom, Paul Harry, 6,040,389, Cl. 525-332.600.

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Sankousha Co., Ltd.: *See*—
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Yoshida, Akira; Oda, Kozo; Kasai, Takashi; Shimada, Kousei; Kogen, Hiroshi; Hayakawa, Ichiro; Ishihara, Sadao; Koga, Teiichiro; Kitazawa, Eiichi; and Tokui, Taro, 6,040,339, Cl. 514-485.000.

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Del Soldato, Piero; and Sannicolo', Francesco, 6,040,341, Cl. 514-509.000.

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Tanaka, Hiroaki; Okido, Yoshiyuki; and Sano, Hideki, 6,039,910, Cl. 264-248.000.

Sano, Kazushi: *See*—
Hisano, Seiichi; Saito, Kazuhisa; Sano, Kazushi; Konno, Shinichi; Horikawa, Yoshichika; and Aihara, Yasuhiko, 6,040,043, Cl. 428-323.000.

Sano, Kimiyasu: *See*—
Ota, Toshiyuki; Sano, Kimiyasu; Tashiro, Hideaki; and Sato, Hozumi, 6,040,117, Cl. 430-311.000.

Sano, Konosuke: *See*—
Kojima, Hiroyuki; Ogawa, Yuri; Kawamura, Kazue; and Sano, Konosuke, 6,040,160, Cl. 435-115.000.
Sano, Masato: *See*—
Fleischhauer, Grier S.; Higgins, Charles T.; Losee, D. Bruce; Nelson, J. Robert, Jr.; Ripley, Robert L.; Sano, Masato; Sharpe, David E.; and Watkins, Michael L., 6,040,560, Cl. 219-494.000.
Sano, Toshiaki; Ishii, Tomoyuki; Yano, Kazuo; and Mine, Toshiyuki, to Hitachi, Ltd. Semiconductor memory device. 6,040,605, Cl. 257-369.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Hiraoka, Noriyoshi; and Takahashi, Masanori, 6,039,618, Cl. 440-89.000.
Santa, Gene J., Jr. Bulkhead penetrator and method for separating cables from a bulkhead penetrator. 6,039,324, Cl. 277-606.000.
Santen Pharmaceutical Co., Ltd.: *See*—
Nakata, Katsuhiko; Nakamura, Masatsugu; and Hamano, Takashi, 6,040,343, Cl. 514-549.000.
Santini, Andree F.; and Miller, Richard E., to Binney & Smith Inc. Washable coloring composition suitable for use in dry erase markers. 6,040,359, Cl. 523-161.000.
Santini, Thomas F., to Wessel Fragrances, Inc. Method and apparatus for dispensing volatile components of an air treating gel. 6,039,266, Cl. 239-60.000.
Santos, Gregory N.: *See*—
Melo, Maria L.; and Santos, Gregory N., 6,040,845, Cl. 345-520.000.
Santry, Charles N.: *See*—
Dupre, Herman K.; and Santry, Charles N., 6,039,265, Cl. 239-14.200.
Sanyo Chemical Industries Ltd.: *See*—
Kinsho, Toshihiko; Satake, Munekazu; and Miyazaki, Tadakazu, 6,040,398, Cl. 525-527.000.
Sanyo Electric Co., Ltd.: *See*—
Hamagishi, Goro; Kanatani, Keiichi; Kishimoto, Shunichi; Sakata, Masahiro; Yamashita, Atsuhiro; Matsushita, Naoki; and Mashitani, Ken, 6,040,807, Cl. 345-6.000.
Kubota, Norikazu, 6,039,560, Cl. 431-9.000.
Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji; Fujimoto, Masahisa; Nohma, Toshiyuki; and Nishio, Koji, 6,040,090, Cl. 429-231.950.
Takahashi, Tatsuya, 6,040,859, Cl. 348-243.000.
Toya, Shoichi; and Kokuga, Toshiharu, 6,040,680, Cl. 320-108.000.
Sanyo Machine Works, Ltd.: *See*—
Ito, Shinichi, 6,038,767, Cl. 29-888.020.
Sarasohn, Neil: *See*—
Faulkner, W. Harrison, III; Bullock, David; DeGray, Dennis; and Sarasohn, Neil, 6,039,217, Cl. 222-146.500.
Sarco LC: *See*—
Jacobsen, Stephen C.; Davis, Clark C.; and Knutti, David F., 6,039,075, Cl. 137-625.280.
Sarkar, Vivek: *See*—
Ju, Dz Ching; Ng, John Shek-Luen; and Sarkar, Vivek, 6,041,181, Cl. 395-709.000.
Sarkisian, Gevork: *See*—
Miller, Bearge; Miller, Norman K.; Sarkisian, Gevork; Sarkissian, Karen; and Galperin, Anatoly, 6,040,536, Cl. 200-83.00N.
Sarkissian, Karen: *See*—
Miller, Bearge; Miller, Norman K.; Sarkisian, Gevork; Sarkissian, Karen; and Galperin, Anatoly, 6,040,536, Cl. 200-83.00N.
Sarnoff Corporation: *See*—
Levine, Peter Alan; Sauer, Donald Jon; and McCaffrey, Nathaniel Joseph, 6,040,570, Cl. 250-208.100.
Schepps, Jonathan Lloyd, 6,040,774, Cl. 340-572.100.
Sarosy, Michelle A.: *See*—
Blaisdell, Dennis R.; Mattison, Bruce W.; Farthing, Robert C.; and Sarosy, Michelle A., 6,041,171, Cl. 395-500.270.
Sartorelli, Alan C.; Shyam, Krishnamurthy; Penketh, Philip G.; and Chen, Shu-Hui, to Yale University. N,n-bis(sulfonyl)hydrazines useful as antineoplastic agents. 6,040,338, Cl. 514-482.000.
Sasa, Masahiko: *See*—
Kato, Hiroyuki; and Sasa, Masahiko, 6,041,119, Cl. 379-424.000.
Sasahara, Kouji: *See*—
Kanai, Hiroaki; Yagyu, Kiyohide; Maruta, Akira; Sasahara, Kouji; and Shiomi, Tsugio, 6,038,758, Cl. 29-557.000.
Sasajima, Katsuhiro: *See*—
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.
Sasaki, Katsumi: *See*—
Kimura, Kenichi; Shiga, Akira; Hashiguchi, Toshihiko; Murakami, Eiji; and Sasaki, Katsumi, 6,039,752, Cl. 606-205.000.
Sasaki, Takahiro: *See*—
Koike, Yoshio; Ohmuro, Katsufumi; Sasaki, Takahiro; and Takeda, Arihiro, 6,040,885, Cl. 349-129.000.
Sasaki, Tohru: *See*—
Ota, Masuyuki; Kawachi, Genshiro; Kitajima, Masaaki; Sasaki, Tohru; Oh-e, Masahito; Kondo, Katsumi; and Tsumura, Makoto, 6,040,886, Cl. 349-141.000.
Sasaki, Tsuneo, to Kansei Corporation. Automotive air bag device. 6,039,342, Cl. 280-728.300.
Sasaki, Yasushi: *See*—
Mori, Kenichi; Ito, Katsuya; Kotani, Tooru; Suzuki, Toshitake; and Sasaki, Yasushi, 6,039,444, Cl. 347-105.000.
Sasaki, Yutaka: *See*—
Tanaka, Hiroaki; Sasaki, Yutaka; and Hashimoto, Takuya, 6,040,745, Cl. 333-26.000.
Satake, Munekazu: *See*—
Kinsho, Toshihiko; Satake, Munekazu; and Miyazaki, Tadakazu, 6,040,398, Cl. 525-527.000.
Sato, Atsushi, to Aisin Seiki Kabushiki Kaisha. Valve timing control device. 6,039,015, Cl. 123-90.170.
Sato, Hajime: *See*—
Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; and Sato, Hajime, 6,041,284, Cl. 702-56.000.
Sato, Hideo, to Sony Corporation. Copy protection by inserting a phase-shifted color burst signal into the burst interval of an analog color video signal. 6,041,158, Cl. 386-1.000.
Sato, Hisaaki; Kumagai, Masato; and Araki, Tomoaki, to Unisia Jecs Corporation. Throttle valve device. 6,039,027, Cl. 123-399.000.
Sato, Hisatake, to Oki Electric Industry Co., Ltd. Interface circuit with high speed data transmission. 6,040,723, Cl. 327-144.000.
Sato, Hozumi: *See*—
Ota, Toshiyuki; Sano, Kimiyasu; Tashiro, Hideaki; and Sato, Hozumi, 6,040,117, Cl. 430-311.000.
Sato, Koji: *See*—
Oono, Masahiro; Iwanade, Hisao; Saitoh, Noboru; Sato, Koji; Shiba, Sukenori; Yoshida, Tatsuya; and Nagai, Nobuyuki, 6,040,677, Cl. 318-696.000.
Sato, Shoji: *See*—
Iida, Michihiko; Kawashima, Tetsuji; Sato, Shoji; and Masuda, Shozo, 6,041,029, Cl. 369-50.000.
Sato, Shougo: *See*—
Suzuki, Tsutomu; Sato, Shougo; and Okabe, Yasushi, 6,041,203, Cl. 399-111.000.
Sato, Shuzo; and Ohtorii, Hiizu, to Sony Corporation. Polishing method, abrasive material, and polishing apparatus. 6,039,631, Cl. 451-37.000.
Sato, Susumu: *See*—
Takeda, Sunao; Kaneko, Yasushi; Tokizawa, Minoru; Eto, Hiromichi; Ishida, Kazuya; Maebashi, Kazunori; Matsumoto, Masaru; Asaoka, Takemitsu; and Sato, Susumu, 6,040,325, Cl. 514-383.000.
Sato, Yoshiaki: *See*—
Ohira, Tadashi; Sato, Yoshiaki; and Kodama, Kazuhiko, 6,039,912, Cl. 264-328.100.
Sato, Yoshitoshi: *See*—
Ikeda, Kazuo; Komorita, Hiroshi; Sato, Yoshitoshi; Komatsu, Michiyasu; and Mizunoya, Nobuyuki, 6,040,039, Cl. 428-210.000.
Satoh, Hiroki; Taguchi, Yoshio; and Shoyama, Noriko, to Bando Chemical Industries, Ltd. Water-color ink absorbing material and laminated film having layer of the absorbing material. 6,040,035, Cl. 428-195.000.
Satoh, Hiroshi: *See*—
Minami, Toshiya; Satoh, Hiroshi; and Satoh, Takanobu, 6,040,818, Cl. 345-147.000.
Satoh, Takanobu: *See*—
Minami, Toshiya; Satoh, Hiroshi; and Satoh, Takanobu, 6,040,818, Cl. 345-147.000.
Sauer, Donald Jon: *See*—
Levine, Peter Alan; Sauer, Donald Jon; and McCaffrey, Nathaniel Joseph, 6,040,570, Cl. 250-208.100.
Sauer, Gerald L.: *See*—
Hooper, James R.; Strother, Richard K.; Fish, John; Pawling, Paul G.; and Sauer, Gerald L., 6,040,397, Cl. 525-526.000.
Saulnier, Christian: *See*—
Garcia, Douglas J.; and Saulnier, Christian, 6,040,705, Cl. 324-762.000.
Sauter, Herbert, to Schneider (Europe) A.G. Docking assembly for the extension of a guidewire. 6,039,700, Cl. 600-585.000.
Sauvageau, Mario A.: *See*—
Gilbert, Richard; Sauvageau, Mario A.; and Bourgeois, Stephane, 6,038,920, Cl. 73-170.230.
Savage, George M.; Christian, Jeffrey J.; and Dillow, David Curtis, to FemRx, Inc. Disposable laparoscopic morcellator. 6,039,748, Cl. 606-180.000.
Savage, M. Dean, to Pierce Chemical Company. Formulations for fluorogenic peroxidase assays. 6,040,150, Cl. 435-28.000.
Savage, Susan: *See*—
Bakowski, Mietek; Gustafsson, Ulf; Rottner, Kurt; and Savage, Susan, 6,040,237, Cl. 438-521.000.
Savant, Gajendra D.: *See*—
Ho, Zonh-Zen; Jannson, Tomasz P.; Lieberman, Robert A.; Savant, Gajendra D.; and Wang, Allan, 6,040,171, Cl. 435-288.100.
Savio Macchine Tessili SpA: *See*—
Badiali, Roberto; Bertoli, Luciano; and Colomberotto, Giorgio, 6,039,281, Cl. 242-475.500.
Sawada, Hirotoshi: *See*—
Hyoda, Shunji; Kita, Masaharu; Sawada, Hirotoshi; Nemugaki, Shuichi; Otsuka, Sumio; Miyawaki, Yoshitaka; Ogawa, Takashi; and Kubo, Yuhki, 6,040,453, Cl. 548-250.000.
Sawada, Shinichi; Murata, Shizuo; and Isoyama, Toyoshiro, to Chisso Corporation. Electric optical liquid crystal system. 6,040,890, Cl. 349-182.000.
Sawada, Takayuki, to SMC Kabushiki Kaisha. Cylinder device for displacing workpiece. 6,038,959, Cl. 92-5.00R.
Sawyer, Larry D.: *See*—
Bowman, Howard L.; Darwin, Robert L.; Maraffio, William M.; Sawyer, Larry D.; Williams, Robert B.; Hudson, Frank E.; Hunstad, Mary; and Decker, Mark W., 6,039,124, Cl. 169-61.000.
Sayo, Noboru: *See*—
Miyano, Sotaro; Hattori, Tetsutaro; Uesugi, Osamu; Tamai, Yasufumi; and Sayo, Noboru, 6,040,465, Cl. 549-510.000.

SC-Wireless Inc.: *See*—
Jennings, Earle Willis, III, 6,041,232, Cl. 455-422.000.

SCA Hygiene Products AB: *See*—
Kalentun, Pia; Buschka, Anette; Schmid, Andrea; and Strömbom, Eva, 6,040,494, Cl. 604-369.000.
Larsson, Björn, 6,039,717, Cl. 604-391.000.

Scattergood, Duncan Keith: *See*—
Bickerton, Matthew John; Bohrer, Kathryn Ann; Hughes, Emma Suzanne; Kenworthy, Edward William; Musgrove, Rupert Jeremy; Patterson, LindaMay Rose; Porter, Steven; Salt, David Dennis; and Scattergood, Duncan Keith, 6,041,312, Cl. 705-30.000.

Schablonentechnik Kufstein Aktiengesellschaft: *See*—
Fischer, Hannes, 6,038,971, Cl. 101-129.000.

Schade GmbH & Co. KG: *See*—
Schulte, Martin; and Levermann, Ulrich, 6,039,384, Cl. 296-146.200.

Schädeli, Ulrich; Zambounis, John S.; Iqbal, Abul; Hao, Zhimin; and Dubas, Henri, to Ciba Specialty Chemicals Corporation. Compositions for making structured color images and application thereof. 6,040,108, Cl. 430-200.000.

Schäfer, Herbert: *See*—
Reisinger, Hans; Grüning, Ulrike; Wendt, Hermann; Stengl, Reinhard; Lehmann, Volker; Willer, Josef; Franosch, Martin; Schäfer, Herbert; Krautschneider, Wolfgang; Hofmann, Franz; and Böhm, Thomas, 6,040,995, Cl. 365-185.180.

Schaffer, Daniel H., to Sun Microsystems, Inc,. Imbedding virtual device driver (VxD) calls in a dynamic link library (DLL). 6,041,363, Cl. 709-301.000.

Schall, William D.: *See*—
Venta, Patrick J.; Brewer, George J.; Yuzbasiyan-Gurkan, Vilma; and Schall, William D., 6,040,143, Cl. 435-6.000.

Schaming, Michael J. Flexible cord collar harness device. 6,039,708, Cl. 602-18.000.

Schantz, Matthäus; Köppl, Franz; and Flottmann, Dirk, to Wacker-Chemie GmbH. Optoelectronic separation apparatus. 6,040,544, Cl. 209-577.000.

Schappler, Joseph: *See*—
Houvener, Robert C.; Hoenisch, Ian P.; and Schappler, Joseph, 6,040,783, Cl. 340-825.310.

Schaub, Michael P., to Donnelly Optics. Digital camera objective with diffractive optical surface. 6,040,943, Cl. 359-565.000.

Scheck, Georg; Klippert, Uwe; and Brandt, Carsten, to Brose Fahrzeugteile GmbH & Co. KG, Coburg. Bowden tube window winder with compensation for cable length. 6,038,817, Cl. 49-352.000.

Scheidt & Bachmann GmbH: *See*—
Miller, Gert; and Höffges, Peter, 6,039,314, Cl. 271-9.010.

Schena, Martin J.: *See*—
Khanna, Yash P.; Puterbuagh, Frank H., Jr.; Kuhn, William P.; and Schena, Martin J., 6,040,392, Cl. 525-432.000.

Schenkel, Jeffrey, to Linear Technology Corporation. Low noise step-down switching regulator circuits with programmable slew rate limiter and methods of use. 6,040,686, Cl. 323-282.000.

Schepisi, Natale, to Vital Hair Tools, LLC. Blow dryer having airflow control means. 6,038,782, Cl. 34-97.000.

Schepps, Jonathan Lloyd, to Sarnoff Corporation. Locating system and method employing radio frequency tags. 6,040,774, Cl. 340-572.100.

Scherbring, David J.: *See*—
Comer, Robert C.; and Scherbring, David J., 6,038,989, Cl. 111-123.000.

Scherer, Axel: *See*—
OBrien, John; Scherer, Axel; Yariv, Amnon; Lee, Reginald; Xu, Yuanjian; and Painter, Oskar, 6,040,590, Cl. 257-94.000.

Scherer, David F., to TRW Vehicle Safety Systems Inc. Air bag cover with horn switch. 6,039,343, Cl. 280-731.000.

Schering Aktiengesellschaft: *See*—
Chwalisz, Krzysztof; and Garfield, Robert E., 6,040,340, Cl. 514-509.000.
Krause, Werner; Maier, Franz-Karl; Bauer, Michael; Schuhmann Giampieri, Gabriele; Press, Wolf-Rudiger; and Muschik, Peter, 6,040,432, Cl. 534-16.000.
Mrotzek, Werner; Gräf, Bernd; and Schönke, Ingoberth, 6,039,093, Cl. 141-386.000.
Petrick, Jörg; and Stähle, Michael, 6,039,573, Cl. 434-268.000.
Schmitt-Willich, Heribert; Platzek, Johannes; Gries, Heinz; Schumann-Giampieri, Gabrielle; Weinmann, Hanns-Joachim; Vogler, Hubert; Deutsch, Julius; and Conrad, Juergen, 6,039,931, Cl. 424-9.364.
Scholz, Peter; Weber, Jörg; and Angstwurm, Klemens, 6,040,336, Cl. 514-468.000.

Schering Corporation: *See*—
Njoroge, F. George; Vibulbhan, Bancha; Pinto, Patrick A.; and Girijavallabhan, Viyyoor M., 6,039,683, Cl. 574-274.000.
Taveras, Arthur G.; and Njoroge, George F., 6,040,305, Cl. 514-232.800.

Schertl, Peter: *See*—
Peifer, Bernd; Palackal, Syriac J.; Welch, M. Bruce; Alt, Helmut G.; and Schertl, Peter, 6,040,402, Cl. 526-160.000.

Schetter, Bernhard: *See*—
Prade, Bernd; Schetter, Bernhard; and Streb, Holger, 6,038,864, Cl. 60-748.000.

Scheurlen, Michael, to Siemens Aktiengesellschaft. Turbine blade which can be subjected to a hot gas flow. 6,039,537, Cl. 416-97.00R.

Schidmeister, Erwin: *See*—
Stephens, Roger D.; and Schmidmeister, Erwin, 6,039,280, Cl. 242-388.600.

Schikowsky, Hartmut: *See*—
Albrecht, Klaus; Hoess, Werner; and Schikowsky, Hartmut, 6,040,387, Cl. 525-330.500.

Schilling, Jan C.; Cornell, Jay L.; and Stevenson, Joseph T., to General Electric Company. Panel damped hybrid blade. 6,039,542, Cl. 416-233.000.

Schimitzek, Peter, to CSB-System Software-Entwicklung & Unternehmensberatung GmbH. Method and device for a data management system which is capable of calibration. 6,041,289, Cl. 702-187.000.

Schlage Lock Company: *See*—
Chamberlain, L. C. Derek; and Hensley, Frederick M., 6,038,896, Cl. 70-279.100.

Schlenker, Michael: *See*—
Focke, Heinz; Häfker, Thomas; Stiller, Martin; and Schlenker, Michael, 6,038,832, Cl. 53-234.000.

Schless, Ely. Multi-terrain electric motor driven cycle. 6,039,137, Cl. 180-220.000.

Schlesselmann, John D.: *See*—
Caulfield, John T.; Wyles, Richard H.; Schlesselmann, John D.; and Pettijohn, Kevin L., 6,040,568, Cl. 250-208.100.

Schlumberger Technology Corporation: *See*—
Ramakrishnan, Terizhandur S.; Schwartz, Lawrence M.; Fordham, Edmund J.; Kenyon, William E.; and Wilkinson, David J., 6,040,696, Cl. 324-303.000.

Schmalz, Kurt; Schmalz, Wolfgang; and Eisele, Thomas, to J. Schmalz GmbH. Vacuum manipulation device. 6,039,530, Cl. 414-627.000.

Schmalz, Wolfgang: *See*—
Schmalz, Kurt; Schmalz, Wolfgang; and Eisele, Thomas, 6,039,530, Cl. 414-627.000.

Schmalzried, Guenther: *See*—
Ruppel, Wolfgang; and Schmalzried, Guenther, 6,039,112, Cl. 165-109.100.

Schmid, Andrea: *See*—
Kalentun, Pia; Buschka, Anette; Schmid, Andrea; and Strömbom, Eva, 6,040,494, Cl. 604-369.000.

Schmid, Michael, to Ina Walzlarger Schaefler KG. Tensioning device for traction systems such as belts and chains. 6,039,664, Cl. 474-135.000.

Schmidmeister, Erwin: *See*—
Stephens, Roger D.; and Schmidmeister, Erwin, 6,039,280, Cl. 242-388.600.

Schmidt, Elke Maria: *See*—
Hegner, Frank; Schmidt, Elke Maria; Güther, Volker; Otto, Andreas; Breme, Jürgen; Müller, Heinz; and Turnsek, Jürgen Peter, 6,039,918, Cl. 420-422.000.

Schmidt, Robert: *See*—
Batistic, Ivica; and Schmidt, Robert, 6,041,277, Cl. 701-71.000.

Schmidt, Rudolf; and Thalhofer, Augustin. Device for controlling the intensity of the light emitted by a lighting element of a lighting apparatus, in particular a flashlight. 6,040,660, Cl. 315-200.00A.

Schmitt, John V.; and Marsh, Richard A., to Applied Materials Inc. Measurement of quantity of incompressible substance in a closed container. 6,038,919, Cl. 73-149.000.

Schmitt, Stefan: *See*—
Lehnen, Hans Gunter; Lorig, Roland; and Schmitt, Stefan, 6,038,930, Cl. 73-774.000.

Schmitt, Ty; and Sim, Vibora, to Dell USA, L.P. Method and apparatus for a power supply cam with integrated cooling fan. 6,040,981, Cl. 361-695.000.

Schmitt, Ty. R., to Dell USA, L.P. Combination keylock device and securing device. 6,038,892, Cl. 70-78.000.

Schmitter, Paul: *See*—
Rock, David A.; Schmitter, Paul; Castelnuovo, David; and Goebel, Clement James, III, 6,039,047, Cl. 128-897.000.

Schmitt-Willich, Heribert; Platzek, Johannes; Gries, Heinz; Schumann-Giampieri, Gabrielle; Weinmann, Hanns-Joachim; Vogler, Hubert; Deutsch, Julius; and Conrad, Juergen, to Schering Aktiengesellschaft. Derivatized DTPA complexes, pharmaceutical agents containing these compounds, their use, and processes for their production. 6,039,931, Cl. 424-9.364.

Schmitz, Tracy: *See*—
Huber, Brigitte T.; Schmitz, Tracy; and Underwood, Robert, 6,040,145, Cl. 435-7.200.

Schnabel, Werner: *See*—
Butz, Thomas; Kaller, Ralf; Kissel, Guenther; Mayer, Gehard; Koch, Volker; and Schnabel, Werner, 6,039,779, Cl. 55-499.000.

Schnapp, Susan T: *See*—
Dunphy, Katherine Ann; Schnapp, Susan T; and Johnson, David C, 6,039,443, Cl. 347-92.000.

Schneeberger, Niklaus: *See*—
Münch, Ulrich; Jaeggi, Dominik; and Schneeberger, Niklaus, 6,040,579, Cl. 250-344.000.

Schneider (Europe) A.G.: *See*—
Sauter, Herbert, 6,039,700, Cl. 600-585.000.

Schneider, Daniel P., to Kelsey Hayes Company. Slide pin bushing for disc brake assembly. 6,039,156, Cl. 188-73.440.

Schneider, Hans jun; and Schneider, Rolf. Caterpillar board designed in particular for use on grass slopes. 6,039,331, Cl. 280-14.200.

Schneider (USA) Inc.: *See*—
Hostettler, Fritz; Rhum, David; Forman, Michael R.; Helmus, Michael N.; and Ding, Ni, 6,040,058, Cl. 428-457.000.

Schneider, Jon: *See*—
Carroll, Patrick; Schneider, Jon; and Bell, Douglas E., 6,040,195, Cl. 436-514.000.

Schneider, Luke V.: *See*—

Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.

Schneider National, Inc.: *See*—
Danford-Klein, Henrik; and Kring, John, 6,041,318, Cl. 705-400.000.

Schneider, Otto; and Kratschmera, Ralf, to Wacker-Chemie GmbH. Process for altering the viscosity of organopolysiloxanes. 6,040,410, Cl. 528-14.000.

Schneider, Rolf: *See*—
Schneider, Hans jun; and Schneider, Rolf, 6,039,331, Cl. 280-14.200.

Schneidereit, Ulrich: *See*—
Esser, Thomas; and Schneidereit, Ulrich, 6,040,854, Cl. 348-159.000.

Schoenzeit, Loren: *See*—
Glass, William H.; Lokhorst, Mark; Lodwick, Philip A.; and Schoenzeit, Loren, 6,041,200, Cl. 399-82.000.

Schoepf, Joseph L.: *See*—
Liston, Laurence D. N.; Schoepf, Joseph L.; and Royalty, Charles Michael, 6,039,287, Cl. 244-54.000.

Scholz, Friedhold: *See*—
Koch, Michael; Kock, Wulf; Lupton, David Francis; and Scholz, Friedhold, 6,039,920, Cl. 420-590.000.

Scholz, Matthew T.; and Tiers, George V., to Minnesota Mining and Manufacturing Company. Coating composition having anti-reflective and anti-fogging properties. 6,040,053, Cl. 428-412.000.

Scholz, Peter; Weber, Jörg; and Angstwurm, Klemens, to Schering Aktiengesellschaft. Prostane derivatives and the combination thereof with antibiotics in the treatment of bacterial infections. 6,040,336, Cl. 514-468.000.

Schönke, Ingoberth: *See*—
Mrotzek, Werner; Gräf, Bernd; and Schönke, Ingoberth, 6,039,093, Cl. 141-386.000.

Schoolcraft, Brian: *See*—
Brown, Cary Lee; Hartsfield, Richard C.; Harter, Bernard Gerald; and Schoolcraft, Brian, 6,040,647, Cl. 310-89.000.

Schoonmaker, Peter M.: *See*—
Stoner, George S.; and Schoonmaker, Peter M., 6,039,534, Cl. 415-162.000.

Schöps, Karl-Friedrich; and Warzecha, Wolfgang, to Otis Elevator Company. Elevator system with controller located under elevator landing. 6,039,152, Cl. 187-414.000.

Schreck, Roman, to Rosch Holding S.A. Automatic toilet seat with protective covering. 6,038,708, Cl. 4-244.100.

Schreck, Stefan G.: *See*—
Carpentier, Alain; Guo, George X.; and Schreck, Stefan G., 6,039,759, Cl. 623-2.000.

Schremmer, Gottfried: *See*—
Patzelt, Helmut; and Schremmer, Gottfried, 6,039,350, Cl. 280-775.000.

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Kent, Stephen Brian Henry; Milton, Saskia Charlotte Florence; and Milton, Raymond Cecil deLisle, 6,040,133, Cl. 435-4.000.

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Kawasaki, Toshisuke; and Oka, Shogo, 6,040,156, Cl. 435-69.100.
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Milanesi, Andrea; Poletto, Vanni; Poma, Alberto; and Morelli, Marco, 6,040,736, Cl. 327-541.000.
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Hayashi, Motohiko; and Tanaka, Masahiro, 6,040,921, Cl. 358-434.000.
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Kurogane, Saori; and Sakamoto, Hiromi, 6,040,206, Cl. 438-149.000.
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Ueda, Makoto; Shiga, Shigenori; Tajima, Satoko; and Morishita, Hideki, 6,041,091, Cl. 376-327.000.

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Yuyama, Shoji; and Shigeyama, Yasuhiro, 6,039,209, Cl. 221-171.000.

Shiina, Kazuhiro; Kawamoto, Koji; Miura, Masato; Ohura, Hitoshi; Ozeki, Shoichi; Akiyama, Noboru; Nunomura, Kunihoro; Nemoto, Minehiro; and Iwamura, Masahiro, to Hitachi, Ltd.; and Hitachi Haramachi Electronics Co., Ltd. Driver circuit, driver integrated circuit, and display device and electronic device using the driver circuit and driver integrated circuit. 6,040,827, Cl. 345-208.000.

Shiitani, Shuichi; and Watanabe, Masaki, to Fujitsu Limited. Modelling method, modelling system, and computer memory product of the same. 6,040,836, Cl. 345-427.000.

Shikata, Masaru: *See*—
Kushihi, Yuichi; and Shikata, Masaru, 6,040,806, Cl. 343-853.000.

Shikoku Kakoki Co., Ltd.: *See*—
Fujikawa, Yasuji; and Ueda, Michio, 6,039,058, Cl. 134-104.100.

Shima, Kazuo: *See*—
Hagiwara, Yoshihiro; Suetsugu, Junichi; Mizoguchi, Tadashi; Minemoto, Hitoshi; Takemoto, Hitoshi; Shima, Kazuo; and Yakushiji, Toru, 6,039,442, Cl. 347-89.000.

Shimada, Kousei: *See*—
Yoshida, Akira; Oda, Kozo; Kasai, Takashi; Shimada, Kousei; Kogen, Hiroshi; Hayakawa, Ichiro; Ishihara, Sadao; Koga, Teiichiro; Kitazawa, Eiichi; and Tokui, Taro, 6,040,339, Cl. 514-485.000.

Shimadu, Toru: *See*—
Ootuka, Minoru; Hiraoka, Hirokazu; Shimadu, Toru; and Noda, Masayuki, 6,040,252, Cl. 442-169.000.

Shimaguchi, Hirotada: *See*—
Kawawada, Naoki; Namiki, Hiroaki; Takehara, Isamu; Iwaki, Tadao; Ishida, Takashi; Hayashizaki, Shinichi; Shimaguchi, Hirotada; and Konno, Katsushige, 6,040,648, Cl. 310-90.000.

Shimano, In.: *See*—
Sugimoto, Masanori, 6,039,153, Cl. 188-24.220.

Shimano, Inc.: *See*—
Nakamura, Yasushi, 6,039,665, Cl. 474-157.000.

Shimazawa, Yoichi: *See*—
Tamagaki, Akira; Shimazawa, Yoichi; Matsuda, Hideo; and Yoshiura, Syoichiro, 6,040,924, Cl. 358-523.000.

Shimeki, Yasuharu: *See*—
Yamamoto, Hiroshi; Shimeki, Yasuharu; Kayashima, Kazuhiro; Maruno, Susumu; Fujimoto, Makoto; and Kojima, Yoshihiro, 6,040,825, Cl. 345-173.000.
Yamamoto, Hiroshi; Niwa, Hisao; Kojima, Yoshihiro; Maruno, Susumu; Kayashima, Kazuhiro; Kouda, Toshiyuki; Maekawa, Hidetsugu; Ito, Satoru; and Shimeki, Yasuharu, 6,041,141, Cl. 382-231.000.

Shimizu, Akio: *See*—
Kimura, Nobutake; Ariga, Masato; Yamakawa, Hirohito; Nakagawa, Yoshio; and Shimizu, Akio, 6,040,495, Cl. 800-8.000.

Shimizu, Satoshi; and Oda, Hidekazu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit having silicided elements of short length. 6,040,629, Cl. 257-770.000.

Shimizu, Shigemi: *See*—
Fukushima, Eiji; and Shimizu, Shigemi, 6,038,960, Cl. 92-12.200.

Shimizu, Toshiyuki: *See*—
Odashima, Hisao; Takahashi, Tomomi; and Shimizu, Toshiyuki, 6,040,054, Cl. 428-413.000.

Shimoda, Kazuhisa: *See*—
Takehara, Nobuyuki; Shimoda, Kazuhisa; and Morishita, Yasuo, 6,038,771, Cl. 29-897.200.

Shimoi, Yoichi; Tamura, Hideo; Okazaki, Masaomi; and Suganuma, Takao, to Nittetu Chemical Engineering Ltd.; and Ajinomoto Co., Inc. Method for separating and recovering objective component. 6,039,879, Cl. 210-641.000.

Shimojo, Masato: *See*—
Yamamoto, Ichiro; Itoh, Manabu; Shimojo, Masato; Yumiya, Yasunobu; Mukaihira, Takafumi; and Akada, Yasushige, 6,040,331, Cl. 514-411.000.

Shimosaka, Hirotaka: *See*—
Kasashima, Atsuki; Ihara, Keisuke; and Shimosaka, Hirotaka, 6,039,660, Cl. 473-378.000.

Shimura, Masato: *See*—
Matsuyama, Shigeru; Asuma, Hiroaki; Shimura, Masato; Tomita, Yoshifumi; and Aratani, Sukekazu, 6,040,887, Cl. 349-141.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Fujiki, Hironao; Miyoshi, Kei; and Muramatsu, Hironobu, 6,040,361, Cl. 523-209.000.
Fukuda, Kenichi; and Tarumi, Yasuo, 6,040,400, Cl. 526-126.000.

Shin-Etsu Polymer Co., Ltd.: *See*—
Imai, Tsuyoshi, 6,040,037, Cl. 428-209.000.

Shin, Hung Tae: *See*—

Lee, Yoon Pyo; Lee, Chun Sik; Kim, Kwang Ho; Jurng, Jong Soo; Kim, Young Il; Shin, Hung Tae; and Han, Hee Suk, 6,038,869, Cl. 62-100.000.

Shin Jiuh Corp.: *See*—
Chou, Chin-Wen, 6,039,478, Cl. 400-472.000.

Shin-Kobe Electric Machinery Co.: *See*—
Ootuka, Minoru; Hiraoka, Hirokazu; Shimadu, Toru; and Noda, Masayuki, 6,040,252, Cl. 442-169.000.

Shinchi, Akira, to Yazaki Corporation. Method of fixing packing and structure for fixing packing. 6,039,592, Cl. 439-271.000.

Shinkawa, Osamu; and Koike, Kunio, to Seiko Epson Corporation. Electronically controlled mechanical timepiece and control method therefor. 6,041,021, Cl. 368-64.000.

Shinko Electric Co., Ltd.: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.

Shinohara, Hisaji: *See*—
Kitamura, Tadao; and Shinohara, Hisaji, 6,040,528, Cl. 174-138.00C.

Shinohara, Tsutomu: *See*—
Ohmi, Tadahiro; Yamaji, Michio; Shinohara, Tsutomu; Itoi, Shigeru; Hirao, Keiji; Kawano, Yuji; Tanaka, Shigeaki; Yokoyama, Kosuke; Morokoshi, Hiroshi; and Ikeda, Nobukazu, 6,039,360, Cl. 285-61.000.

Shinya, Keigo; Kou, Wen Long; Suzuki, Osamu; and Tetsui, Shunichi, to Denyo Kabushiki Kaisha. Engine driven arc welder. 6,040,556, Cl. 219-133.000.

Shioda, Takuya: *See*—
Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, 6,041,082, Cl. 375-300.000.

Shiomi, Tsugio: *See*—
Kanai, Hiroaki; Yagyu, Kiyohide; Maruta, Akira; Sasahara, Kouji; and Shiomi, Tsugio, 6,038,758, Cl. 29-557.000.

Shiotsu, Tamotsu: *See*—
Yamamoto, Iwao; Kakikura, Eisaku; Kinouchi, Masami; Inoue, Yoshiaki; and Shiotsu, Tamotsu, 6,040,051, Cl. 428-367.000.

Shipley Company, L.L.C.: *See*—
Sonnenberg, Wade; Houle, Patrick J.; Luong, Thong B.; Shelnut, James G.; and Fisher, Gordon, 6,039,859, Cl. 205-159.000.

Shipman, Mark S.; Christeson, Orville H.; and Labatte, Timothy E. W., to Intel Corporation. Method and apparatus for protecting data using lock values in a computer system. 6,041,385, Cl. 710-200.000.

Shirai, Kenji; Yokoyama, Seiya; and Oota, Tsutomu, to Toyota Jidosha Kabushiki Kaisha. Electric brake device. 6,040,665, Cl. 318-14.000.

Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, to Nitto Denko Corporation. Process and apparatus for the removal of resist. 6,040,110, Cl. 430-258.000.

Shiraishi, Takuya; Nogi, Toshiharu; Ohsuga, Minoru; Nakayama, Yoko; and Tokuyasu, Noboru, to Hitachi, Ltd. Method of controlling internal combustion engine. 6,039,026, Cl. 123-399.000.

Shiraiwa, Masaru: *See*—
Ono, Katsuya; Shiraiwa, Masaru; and Nishioka, Kimihiko, 6,041,154, Cl. 385-116.000.

Shirakawa, Takuya: *See*—
Sageser, David Mark; Shirakawa, Takuya; and Morimoto, Koichi, 6,039,906, Cl. 264-156.000.

Shiroshima, Kiyoyuki: *See*—
Kitaguchi, Akira; Hatakenaka, Makoto; Nakajima, Michio; Motonami, Kaoru; Shiroshima, Kiyoyuki; and Yamashita, Takekazu, 6,040,614, Cl. 257-529.000.

Shlik, Oleg Eduardovich, to Accusteel Ltd. Method for measuring the temperature of a metallurgical furnace using an acoustic noise parameter and rate of consumption of electrical power. 6,039,472, Cl. 374-117.000.

Shogren, Randal: *See*—
Doane, William M.; Lawton, John W., Jr.; and Shogren, Randal, 6,040,063, Cl. 428-532.000.

Shon, Ho Seok: *See*—
Yoon, Sang Youl; and Shon, Ho Seok, 6,040,097, Cl. 430-28.000.

Shoot the Moon Products, Inc.: *See*—
Small, David, 6,040,870, Cl. 348-476.000.

Shou, Guoliang: *See*—
Ito, Fumihito; and Shou, Guoliang, 6,040,228, Cl. 438-393.000.

Showa Corporation: *See*—
Nakamura, Tamotsu, 6,039,617, Cl. 440-61.000.

Showa Shell Sekiyu K.K.: *See*—
Kushiya, Katsumi; Okumura, Daisuke; and Sugiyama, Ichiro, 6,040,521, Cl. 136-265.000.

Shoyama, Noriko: *See*—
Satoh, Hiroki; Taguchi, Yoshio; and Shoyama, Noriko, 6,040,035, Cl. 428-195.000.

Shpilberg, Ilya: *See*—
Poreh, Illan; Algom, Avner; Vaindiner, Alexander; and Shpilberg, Ilya, 6,040,832, Cl. 345-340.000.

Shturman Cardiology Systems, Inc.: *See*—
Shturman, Leonid; Morov, Georgiy; and Malgichev, Vladimir, 6,039,747, Cl. 606-159.000.

Shturman, Leonid; Morov, Georgiy; and Malgichev, Vladimir, to Shturman Cardiology Systems, Inc. Rotational atherectomy device with improved optical tachometer. 6,039,747, Cl. 606-159.000.

Shubinsky, Vladimir: *See*—
Butkovich, George M.; and Shubinsky, Vladimir, 6,038,936, Cl. 74-15.400.

Shuey, David Joseph: *See*—
Franco, Rodrigo; Chen, Ai Ru Sun; and Shuey, David Joseph, 6,040,436, Cl. 536-23.100.

Shyam, Krishnamurthy: *See*—
Sartorelli, Alan C.; Shyam, Krishnamurthy; Penketh, Philip G.; and Chen, Shu-Hui, 6,040,338, Cl. 514-482.000.

Shyang Feng Electric & Machinery Co., Inc.: *See*—
Hu, Francisco, 6,038,894, Cl. 70-224.000.

Si, Joan Qi: *See*—
Wagner, Peter; and Si, Joan Qi, 6,039,982, Cl. 426-18.000.
Wagner, Peter; and Si, Joan Qi, 6,039,983, Cl. 426-18.000.

Sick AG: *See*—
Reichenbach, Jürgen; and Hippenmeyer, Heinrich, 6,039,253, Cl. 235-462.010.

Sicom, Inc.: *See*—
McCallister, Ronald D., 6,041,088, Cl. 375-358.000.

Siegel, Jörg; Borst, Hans-Ulrich; Bell, Peter; Büscher, Ralf; Reif, Heinz; and Jung, Jürgen, to Agfa-Gevaert NV. High-speed color photographic recording material having increased sensitivity in the blue spectral region. 6,040,125, Cl. 430-506.000.

Siegel, Joshua: *See*—
Sanchez, Hector; Alvarez, Jose M.; Siegel, Joshua; and Nicoletta, Carmine, 6,040,729, Cl. 327-309.000.

Siegenthaler, Karl J., to Bridgestone Corporation. Method of forming a complete tire carcass. 6,039,825, Cl. 156-111.000.

Sieko Epson Corporation: *See*—
Edatsune, Isao; Kuriyama, Hiroshi; and Urano, Osamu, 6,040,918, Cl. 358-296.000.

Sieling, Frederick W., to Building Materials Corporation of America. Triaminate roofing shingle. 6,038,827, Cl. 52-557.000.

Sieloff, Gloria: *See*—
Paul, William C.; and Sieloff, Gloria, 6,040,250, Cl. 442-61.000.

Siemens AG: *See*—
Lehmann, Volker; and Gericke, Joachim, 6,040,970, Cl. 361-115.000.

Siemens Aktiengesellschaft: *See*—
Becker, Erich, 6,040,694, Cl. 324-230.000.
Fleck, Rod G.; and Arnold, Roger D., 6,041,387, Cl. 711-5.000.
Froese-Peeck, Rüdiger; Gerhard, Detlef; and Lechner, Johann, 6,039,254, Cl. 235-462.320.
Gehre, Hans-Joachim; and Winterstein, Frank, 6,040,640, Cl. 307-66.000.
Haas, Gerhard, 6,040,895, Cl. 355-70.000.
Kraiczyk, Josef; and Mulders, Stephanus, 6,039,601, Cl. 439-500.000.
Meiler, Reinhold; and Stevens, Dirk, 6,038,761, Cl. 29-605.000.
Pfab, Hans, 6,040,750, Cl. 335-156.000.
Prade, Bernd; Schetter, Bernhard; and Streb, Holger, 6,038,864, Cl. 60-748.000.
Regn, Judith, 6,041,249, Cl. 600-429.000.
Reisinger, Hans; Grüning, Ulrike; Wendt, Hermann; Stengl, Reinhard; Lehmann, Volker; Willer, Josef; Franosch, Martin; Schäfer, Herbert; Krautschneider, Wolfgang; Hofmann, Franz; and Böhm, Thomas, 6,040,995, Cl. 365-185.180.
Scheurlen, Michael, 6,039,537, Cl. 416-97.00R.
Schrems, Martin, 6,040,211, Cl. 438-238.000.
Sung, Chih-Ta Star; Mattela, Venkat; Afsar, Muhammad; Singh, Balraj; and Hung, Chih-Teng, 6,040,998, Cl. 365-194.000.

Siemens Aktiengesellschaft: *See*—
Farsakh, Christof, 6,041,237, Cl. 455-450.000.

Siemens Automotive Corporation: *See*—
Ren, Wei-Min; and Wieczorek, David, 6,039,272, Cl. 239-597.000.
Robinson, Barry S.; and Kilgore, Jason T., 6,039,030, Cl. 123-457.000.

Siemens Electromechanical Components GmbH & Co. KG: *See*—
Haehnel, Thomas; Breitlow-Hertzfeldt, Juergen; Saffian, Bernd; and Kern, Josef, 6,040,751, Cl. 335-185.000.

Siemens Westinghouse Power Corporation: *See*—
Amos, David J.; and Stokes, Mitchell O., 6,038,861, Cl. 60-737.000.

SIG Pack Systems AG: *See*—
Odenthal, Heinz F., 6,038,837, Cl. 53-484.000.

Sigma Laboratories, Inc.: *See*—
Mikhael, Michael G.; Boufelfel, Ali; and Yializis, Angelo, 6,040,017, Cl. 427-496.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Moretti, Sonia, 6,040,346, Cl. 514-642.000.

Sigmar, Axel M.; Iseli, James W.; Szalay, Jozsef; Haide, Janos; and Feszthammer, Andras A., to Input/Output, Inc. Remote control system for seismic acquisition. 6,041,283, Cl. 702-16.000.

Siira, Mikko, to Nokia Telecommunications Oy. Transmission method and a cellular radio system. 6,041,230, Cl. 455-422.000.

Sikdar, Subhas; and Vane, Leland, to United States of America, Environmental Protection Agency. Recovery of volatile organic compounds from emulsion of volatile organic compounds in water by pervaporation. 6,039,878, Cl. 210-640.000.

Sikes, Jimmy A. Convection based cooking apparatus with improved air-flow. 6,038,964, Cl. 99-340.000.

Sikkema, Doetze Jakob; and Reichwein, Adrianus Maria, to Akzo Nobel N.V. Process for dicarboxylating dihydric phenols. 6,040,478, Cl. 562-424.000.

Silberg, Barry. External ultrasound treatment of connective tissue. 6,039,048, Cl. 128-898.000.

Silhánková, Alexandra: *See*—

Hohlweg, Rolf; Madsen, Peter; Jørgensen, Tine Krogh; Andersen, Knud Erik; Watson, Brett; Polivka, Zdenek; Konigova, Otylie; Kovandova, Martina; Silhánková, Alexandra; and Valenta, Vladimir, 6,040,302, Cl. 514-217.000.

Silicone Specialties, Inc.: *See*—
Cathey, Joe Ray, 6,039,503, Cl. 404-67.000.

Siller, Curtis A.: *See*—
Doshi, Bharat Tarachand; Dravida, Subrahmanyam; Kustka, George John; Magill, Peter D.; Siller, Curtis A.; and Sriram, Kotikalapudi, 6,041,051, Cl. 370-352.000.

Silva, Albert W.: *See*—
Cooper, Austin M.; Hazencomb, Robert M.; Silva, Albert W.; and Wright, Robert William, 6,039,860, Cl. 205-208.000.

Silva, Christopher Patrick: *See*—
Clark, Christopher Joseph; Moulthrop, Andrew Alfred; Muha, Michael Steven; and Silva, Christopher Patrick, 6,041,077, Cl. 375-224.000.

Silverberg, Michael D.: *See*—
Bittar, Joseph; Barker, Frederick H.; Cooney, Anthony; Perl, David I.; Peruggi, Richard E.; and Silverberg, Michael D., 6,038,980, Cl. 104-20.000.

Silvis, Gary: *See*—
Snoke, Steven R.; Silvis, Gary; and Howland, Thomas E., 6,039,417, Cl. 312-257.100.

Sim, Vibora: *See*—
Schmitt, Ty; and Sim, Vibora, 6,040,981, Cl. 361-695.000.

Simon, Bernd, to Howmedica GmbH. Targeting apparatus for a locking nail. 6,039,739, Cl. 606-64.000.

Simpson Farm Enterprises, Inc.: *See*—
Simpson, Virgil, 6,038,990, Cl. 111-124.000.

Simpson, Virgil, to Simpson Farm Enterprises, Inc. Seeder and liquid applicator. 6,038,990, Cl. 111-124.000.

Sindelar, Karel: *See*—
Andersen, Knud Erik; Jørgensen, Tine Krogh; Hohlweg, Rolf; Fischer, Erik; Olsen, Uffe Bang; Polivka, Zdenek; Sindelar, Karel; and Valenta, Vladimir, 6,040,318, Cl. 514-329.000.

Sinerchio, John A.: *See*—
Ruffolo, Ralph A.; and Sinerchio, John A., 6,041,288, Cl. 702-184.000.

Singer, Irek: *See*—
Symonds, Robert D.; Singer, Irek; St. George, Peter; and Gill, Robert Bradley, 6,039,245, Cl. 235-379.000.

Singh, Balraj: *See*—
Sung, Chih-Ta Star; Mattela, Venkat; Afsar, Muhammad; Singh, Balraj; and Hung, Chih-Teng, 6,040,998, Cl. 365-194.000.

Singh, Jaswinder, to CCL Industries Inc. Aerosol dispenser. 6,039,212, Cl. 222-30.000.

Singh, Rajinder Paul: *See*—
Liu, Peichun Peter; Singh, Rajinder Paul; and Tung, Shih-Hsiung Steve, 6,041,390, Cl. 711-110.000.

Singh, Ranbir: *See*—
Dennis, Donald C.; Radosevich, Joseph R.; and Singh, Ranbir, 6,040,616, Cl. 257-535.000.

Singh, Vikram: *See*—
Dhindsa, Rajinder; Singh, Vikram; and Tokunaga, Ken, 6,039,836, Cl. 156-345.000.

Singhal, Sandeep Kishan: *See*—
Nguyen, Binh Q.; Redpath, Richard J.; and Singhal, Sandeep Kishan, 6,041,343, Cl. 709-203.000.

Siniaguine, Oleg, to IPEC Precision, Inc. Apparatus for generating and deflecting a plasma jet. 6,040,548, Cl. 219-121.480.

Sinnott, Robert A.; Clark, W. Dennis; and DeBoer, Kenneth Frank, to Larreacorp, Ltd. Nontoxic extract of *Larrea tridentata* and method of making the same. 6,039,955, Cl. 424-195.100.

Siomkin, Boris Vasilievich: *See*—
Zinoviev, Nikolai Timofeevich; and Siomkin, Boris Vasilievich, 6,039,274, Cl. 241-1.000.

Sioud, Mouldy, to Gene Shears Pty. Limited. TNF-α ribozymes and derivatives capable of decreasing degradation of MRNA in vivo. 6,040,159, Cl. 435-91.310.

SiRF Technology, Inc.: *See*—
Kohli, Sanjai; and Chen, Steven, 6,041,280, Cl. 701-201.000.

Siros Technologies, Inc.: *See*—
Heanue, John F.; Daiber, Andrew J.; and Colvin, James, 6,040,930, Cl. 359-21.000.

Sistanizadeh, Kamran: *See*—
Bigham, John A.; Little, Dave; Mihm, Edward C.; Sistanizadeh, Kamran; Amin-Salehi, Bahman; Jain, Alpna; Lightfoot, Regina; and Arthur, Ulric E., 6,041,056, Cl. 370-395.000.

Sitrin, Michael D.: *See*—
Brasitus, Thomas A.; Bissonnette, Bruce Marc; and Sitrin, Michael D., 6,040,300, Cl. 514-167.000.

Siu, Burton: *See*—
Bretschneider, Richard; Siu, Burton; and Qureshi, Imran Iqbal, 6,041,333, Cl. 707-203.000.

Sjöwall, Sony, to Vattenfall AB. Method and apparatus handling radioactive waste material. 6,040,491, Cl. 588-16.000.

Skalnyi, Eugene V.: *See*—
Edwards, Stuart D.; Wehman, Thomas C.; Parker, Theodore L.; Kucklick, Theodore; Skalnyi, Eugene V.; and Stein, Alan, 6,039,757, Cl. 623-1.000.

Skarpelos, Michael J.; van der Linden, Robbert; Carley, William J.; Lyon, James M.; and McCline, Matthew C., to Tandem Computers Incorporated. Multi-volume audit trails for fault tolerant computers. 6,041,420, Cl. 714-7.000.

Skjoldborg, Erling: *See*—
Povlsen, Lars; Skjoldborg, Erling; and Goldman, Tomasz Jerzy, 6,041,063, Cl. 370-465.000.

Skoro, John P., III; Bunkenburg, Brian K.; and Shaughnessy, Mark L., to Motorola, Inc. Method and apparatus for monitoring subscriber talk-around usage. 6,041,226, Cl. 455-405.000.

Skrabanja, Arnold Titus Philip; and Tully, Robert Edward, to Akzo Nobel, N.V. Oral liquid antidepressant solution. 6,040,301, Cl. 514-214.000.

Sladek, David T., to Thayer Medical Corporation. Portable chamber for metered dose inhaler dispensers. 6,039,042, Cl. 128-200.230.

Slane, Albert Alfonse: *See*—
Leichty, Philip Lynn; and Slane, Albert Alfonse, 6,041,060, Cl. 370-412.000.

Slangen, Hubertus J. M.; and Kemper, Astrid E., to Holland Sweetener Company V.O.F. Aspartame powders for powder mixtures. 6,039,275, Cl. 241-17.000.

Slater, Joseph A.; and Chan, Sam, to Glaxo Wellcome Inc. Position triggered dispenser and methods. 6,039,211, Cl. 222-1.000.

Slavik, Michael: *See*—
Compadre, Cesar; Breen, Philip; Salari, Hamid; Fifer, E. Kim; Lattin, Danny L.; Slavik, Michael; Li, Yanbin; and O'Brien, Timothy, 6,039,992, Cl. 426-332.000.

Slesinger, Kris Allen: *See*—
Davis, John Gillette; Mays, Allen Thomas; and Slesinger, Kris Allen, 6,039,805, Cl. 118-74.000.

Slettnes, Tor, to Perkin-Elmer Corporation, The. Method and system for velocity-normalized position-based scanning. 6,040,586, Cl. 250-573.000.

Slife, Douglas Alan: *See*—
Coonce, Richard L.; Sharghi, Aaron Safula; and Slife, Douglas Alan, 6,039,319, Cl. 277-314.000.

Slimak, Karen M.: *See*—
Slimak, Robert A.; Haudenschild, Christian C.; and Slimak, Karen M., 6,040,057, Cl. 428-453.000.

Slimak, Robert A.; Haudenschild, Christian C.; and Slimak, Karen M., to Slimak, Karen M. Enhancing the strength, moisture resistance, and fire-resistance of wood, timber, lumber, similar plant-derived construction and building materials, and other cellulosic materials. 6,040,057, Cl. 428-453.000.

Sliwa, Jack; and Blumenfeld, Lee A., to OB Inovations, Inc. Method and apparatus for monitoring cervical diameter. 6,039,701, Cl. 600-588.000.

Sloan, Jack C.: *See*—
Sloan, Mark A.; and Sloan, Jack C., 6,039,213, Cl. 222-39.000.

Sloan-Kettering Institute for Cancer Research: *See*—
Kolesnick, Richard N.; Liu, Jun; and Zhang, Yuhua, 6,040,149, Cl. 435-15.000.

Sloan, Mark A.; and Sloan, Jack C. Hand-holdable, reuseable containers. 6,039,213, Cl. 222-39.000.

Sluder, Larry R.: *See*—
Meyer, Bennett S.; Chatfield, William D.; Sluder, Larry R.; and Radosevich, James W., 6,041,304, Cl. 705-4.000.

Smal, Henri, to Conair Corporation. Hot wax hair remover apparatus. 6,039,482, Cl. 401-1.000.

Small, David, to Shoot the Moon Products, Inc. Method and apparatus for nesting secondary signals within a television signal. 6,040,870, Cl. 348-476.000.

Smart, John E.: *See*—
Keck, Peter C.; and Smart, John E., 6,040,431, Cl. 530-399.000.

Smart Shoes, Inc.: *See*—
Hill, Otho Dale, 6,039,650, Cl. 463-47.000.

SmartDiskette GmbH: *See*—
Eisele, Raymund, 6,039,260, Cl. 235-492.000.

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Sawada, Takayuki, 6,038,959, Cl. 92-5.00R.
Tomita, Taku; Araki, Mitsutoshi; and Yasuda, Naoyuki, 6,039,071, Cl. 137-505.370.

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Smith, Martin Stevens; Smith, Adrian David; Dalley, James Edward Joseph; and McKenna, Stephen John, 6,040,802, Cl. 343-700.0MS.

Smith & Nephew PLC: *See*—
Barlow, Yvonne Margaret; and Lang, Stephen Michael, 6,039,972, Cl. 424-445.000.

Smith, Arthur C.: *See*—
Reccia, Ralph; and Smith, Arthur C., 6,039,247, Cl. 235-379.000.

Smith, Darrick Taylor: *See*—
Mendel, Carl Robert; Smith, Darrick Taylor; Veerkamp, Dennis James; and Voss, Steven Harry, 6,038,755, Cl. 29-281.400.

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Beaton, Timothy P., 6,039,131, Cl. 175-376.000.

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Reed, John Douglas; and Smith, Jack Anthony, 6,041,239, Cl. 455-453.000.

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Bland, Ralph H.; Jonza, James M.; Smith, James D.; Bradley, Jeffrey F.; and Smith, Kenneth B., 6,040,061, Cl. 428-480.000.
Smith, John J.: *See*—
Monroe, John W.; Smith, John J.; Kenyon, Stephen C.; and Anderson, Michael E., 6,040,843, Cl. 345-507.000.
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Larson, Margaret J.; Rutter, John W.; and Smith, Larry L., 6,039,694, Cl. 600-459.000.
Smith, Mark. Vacuum stretching and gripping tool and method for laying flooring. 6,039,371, Cl. 294-8.600.
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Smith, Michael B., to LSI Logic Corporation. N-port algorithm for disabling a node within a network during reset. 6,041,348, Cl. 709-220.000.
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Smith, Nels R.: *See*—
Van Order, Kim L.; Smith, Nels R.; and Hansen, Scott A., 6,038,937, Cl. 74-473.00R.
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Smith, Roy E., to Owens Corning Fiberglas Technology, Inc. Method and apparatus for lubricating continuous fiber strand winding apparatus. 6,040,003, Cl. 427-177.000.
Smith, Scott E., to Procter & Gamble Co., The. Vapor permeable pressurized package. 6,039,222, Cl. 222-386.000.
Smith Sport Optics: *See*—
Ryden, William Dennis; and McNeal, Joseph Ross, 6,038,707, Cl. 2-436.000.
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Winter, Kirt Alan; and Smith, Thomas G., 6,040,927, Cl. 358-534.000.
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Alton, Alfred J.; Beese, James P.; Ekmanis, Juris L.; Henne, Bruce J.; and Smith, William F., 6,040,130, Cl. 430-617.000.
SmithKline Beecham Biologicals: *See*—
Locht, Camille; and Lobet, Yves, 6,040,427, Cl. 530-350.000.
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Diederich, Ann Marie, 6,040,471, Cl. 558-315.000.
Gentry, Daniel Robert; Greenwood, Rebecca Claire; and Lawlor, Elizabeth Jane, 6,040,162, Cl. 435-183.000.
Lawlor, Elizabeth Jane, 6,040,163, Cl. 435-183.000.
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Lawlor, Elizabeth Jane, 6,040,163, Cl. 435-183.000.
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Hartung, Hans-Georg; Münker, Jochen; and Richter, Hans-Peter, 6,038,906, Cl. 72-241.800.
Klein, Dieter, 6,039,374, Cl. 294-67.310.
Müller, Hubert; and Svejkovsky, Ulrich, 6,038,757, Cl. 29-527.700.
Munoz-Baca, Julio Manuel; Bäumer, Klaus; and Bald, Erhard, 6,039,283, Cl. 242-534.000.
Willems, Markus; and Thomas, Reinhold, 6,038,907, Cl. 72-247.000.
Snoke, Steven R.; Silvis, Gary; and Howland, Thomas E., to Stanley Works, The. Easy to assemble storage unit. 6,039,417, Cl. 312-257.100.
Snover, David. Line feeding device for staple guns. 6,039,232, Cl. 227-150.000.
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Bernard, Gus; and Soaft, Jay, 6,039,909, Cl. 264-220.000.
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Cupferman, Sylvie; and Laugier, Jean-Pierre, 6,040,347, Cl. 514-723.000.
Soddu, Claudio: *See*—
Kinal, George Vladimir; Nagle, James Robert, II; Soddu, Claudio; and Ryan, Fintan Richard, 6,040,798, Cl. 342-357.010.
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Sokolowski, Gordon L.: *See*—
Schunck, Richard A.; and Sokolowski, Gordon L., 6,039,667, Cl. 475-159.000.
Solchem Italiana S.p.A.: *See*—
Guazzi, Giuseppe, 6,040,445, Cl. 544-276.000.
Solheim, Alan Glen: *See*—
Khaleghi, Farideh; Solheim, Alan Glen; and Barnard, Chris Wilhelm, 6,040,933, Cl. 359-124.000.
Soltec B.V.: *See*—
Den Dopper, Rolf A., 6,039,236, Cl. 228-46.000.
Solvay Pharmaceuticals GmbH: *See*—
David, Samuel; Antel, Jochen; Brueckner, Reinhard; Ziegler, Dieter; Eeckhout, Christian; Bielenberg, Gerhard-Wilhelm; and Peck, Michael, 6,040,303, Cl. 514-218.000.
Solvay Polyolefins Europe-Belgium (Societe Anonyme): *See*—
Delaite, Emmanuel; Charlier, Jean; and Bertozzi, Giuliano, 6,040,348, Cl. 521-59.000.
Soma, Takao: *See*—
Hanami, Nobuyuki; Kishi, Junichi; Kawamorita, Yoichi; and Soma, Takao, 6,040,099, Cl. 430-66.000.
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Ma, Manny K. F.; Somasekharan, Rajesh; and Li, Wen, 6,040,608, Cl. 257-390.000.
Somatics, Inc.: *See*—
Swartz, Conrad Melton; and Abrams, Richard Stephen, 6,039,046, Cl. 128-859.000.
Someya, Jun, to Mitsubishi Denki Kabushiki Kaisha. Display apparatus for reducing distortion of a displayed image. 6,040,819, Cl. 345-147.000.
Sommer, Andreas, to Celtrix Pharmaceuticals, Inc. Methods for treating diabetes. 6,040,292, Cl. 514-12.000.
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Hummel, Karl Ernst; Luka, Helmut; and Sommer, Bruno, 6,039,780, Cl. 55-502.000.
Sommer, Christopher C.: *See*—
Hichri, Habib; Lesins, Viesturs; and Sommer, Christopher C., 6,040,477, Cl. 562-46.000.
Sommer, Helmut: *See*—
Wandel, Hermann; Jost, Michael; Sommer, Helmut; and Fischer-Wilk, Robert, 6,038,932, Cl. 73-861.650.
Sommers, Allen: *See*—
Woerner, Klaus D.; and Sommers, Allen, 6,039,640, Cl. 451-460.000.
Sone, Yoichi: *See*—
Iwabuchi, Hiroaki; Sone, Yoichi; and Utagawa, Tetsuyuki, 6,040,026, Cl. 428-40.100.
Song, Man-Ho: *See*—
Kang, Young-Cheol; Lee, Byung-Hak; and Song, Man-Ho, 6,039,619, Cl. 445-24.000.
Song, Seungyoon Peter, to International Business Machines Corporation. Method and system for reordering instructions after dispatch in a processing system. 6,041,167, Cl. 395-390.000.
Song, Wang Yan: *See*—
Taomo, Toshio; and Song, Wang Yan, 6,039,037, Cl. 125-13.010.
Songer, Neil W.: *See*—
Hart, Frank P.; Nagaraj, Ravi; Noble, James L.; and Songer, Neil W., 6,041,372, Cl. 710-62.000.
Sonnenberg, Wade; Houle, Patrick J.; Luong, Thong B.; Shelnut, James G.; and Fisher, Gordon, to Shipley Company, L.L.C. Method for electroplating using stabilized dispersions of conductive particles. 6,039,859, Cl. 205-159.000.
Sonotech, Inc.: *See*—
Larson, Margaret J.; Rutter, John W.; and Smith, Larry L., 6,039,694, Cl. 600-459.000.
Sony Corporation: *See*—
Arai, Masayuki; and Kobayashi, Seiji, 6,040,985, Cl. 361-780.000.
Arakawa, Seiichi; Matsute, Masataka; and Kawate, Yasutoshi, 6,039,893, Cl. 252-299.010.
Asai, Toshiya; and Narita, Takato, 6,040,862, Cl. 348-409.000.
Claar, Jeffrey Mark; Duvall, Roger Mather; and Oliver, Richard Joseph, 6,041,407, Cl. 713-1.000.
Gamou, Naoyasu, 6,040,855, Cl. 348-223.000.
Ichimura, Isao; Maeda, Fumisada; Yamamoto, Kenji; Ohsato, Kiyoshi; Watanabe, Toshio; and Suzuki, Akira, 6,041,031, Cl. 369-112.000.
Iida, Michihiko; Kawashima, Tetsuji; Sato, Shoji; and Masuda, Shozo, 6,041,029, Cl. 369-50.000.
Ikeda, Tamotsu, 6,041,432, Cl. 714-786.000.
Izumi, Nobuaki; Fukushima, Shinichi; and Tsukamoto, Junichi, 6,040,873, Cl. 348-559.000.
Kato, Motoki, 6,040,863, Cl. 348-415.000.
Kato, Motoki; Igi, Nobuhiro; and Yasuda, Kazunori, 6,040,865, Cl. 348-416.000.
Kobayashi, Yuji; and Yamashita, Shinichiro, 6,040,524, Cl. 174-36.000.
Lam, Raymond K. F.; Melin, Charles E.; and Colella, Guiseppe, 6,039,788, Cl. 75-623.000.
Miyamoto, Takaaki, 6,040,021, Cl. 427-576.000.
Ohga, Norio; and Ukita, Yoshitaka, 6,041,025, Cl. 369-30.000.
Ohnishi, Sei; and Hatayama, Yoshinori, 6,039,299, Cl. 248-562.000.
Osuga, Satoshi; and Inamoto, Yoshihiro, 6,039,623, Cl. 445-63.000.
Otsuka, Youichi, 6,040,591, Cl. 257-232.000.
Ozcelik, Taner; Gadre, Shirish; and Tan, Yew-Koon, 6,041,400, Cl. 712-35.000.
Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 6,041,191, Cl. 396-311.000.
Sakai, Seiichi; Yoshida, Teruyuki; and Abe, Fumiyoshi, 6,040,693, Cl. 324-210.000.
Sato, Hideo, 6,041,158, Cl. 386-1.000.
Sato, Shuzo; and Ohtorii, Hiizu, 6,039,631, Cl. 451-37.000.
Sugita, Takehiro, 6,041,124, Cl. 380-270.000.
Tsukamoto, Hironori, 6,040,224, Cl. 438-308.000.
Uchino, Katsuhide, 6,040,816, Cl. 345-99.000.
White, Larry L., 6,041,286, Cl. 702-176.000.
Yagasaki, Yoichi; and Tahara, Katsumi, 6,041,160, Cl. 386-94.000.
Yamaguchi, Yuji; Yoshimori, Masaharu; Ozawa, Hiroyuki; Iida, Ryohei; and Taniguchi, Kazuo, 6,040,844, Cl. 345-518.000.

Yasuda, Akio; Nito, Keiichi; Matsui, Eriko; Takanashi, Hidehiko; and Bao, Yang Ying. 6,040,884, Cl. 349-129.000.
Yui, Yasuji; and Kagami, Toshiki. 6,039,431, Cl. 347-30.000.
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Ozcelik, Taner; Gadre, Shirish; and Tan, Yew-Koon. 6,041,400, Cl. 712-35.000.
White, Larry L., 6,041,286, Cl. 702-176.000.
Sony Pictures Entertainment, Inc.: *See—*
Claar, Jeffrey Mark; Duvall, Roger Mather; and Oliver, Richard Joseph. 6,041,407, Cl. 713-1.000.
Soper, Jon C.; and Thomas, M. Teresa, to Givaudan Roure Flavors Corporation. Enzymatically protein encapsulating oil particles by complex coacervation. 6,039,901, Cl. 264-4.300.
Soral, Robert: *See—*
Goss, G. Robert; and Soral, Robert. 6,039,004, Cl. 119-172.000.
Sorenson, Karen. Infant observation mirror attachable to an infant car seat. 6,039,455, Cl. 362-142.000.
Sorkin, Felix L. Method and apparatus for cutting a tendon used in a post-tension anchor system. 6,040,546, Cl. 219-121.390.
Sota, Akio; Okiura, Tomoo; and Azuma, Masaki, to Kyowa Hakko Kogyo Co., Ltd. Preparing organic powder by anaerobically treating fermentation waste fluid and aerobically treating the digested fermentation liquor. 6,039,782, Cl. 71-10.000.
Southpac Trust International, Inc.: *See—*
Weder, Donald E.; and Feld, Jack. 6,039,179, Cl. 206-423.000.
Spaete, Richard; and Cha, Tai-An, to Aviron. Human cytomegalovirus DNA sequences. 6,040,170, Cl. 435-252.300.
Spagnol, Michel: *See—*
Costantini, Michel; Gilbert, Laurent; and Spagnol, Michel. 6,040,484, Cl. 568-803.000.
Spall, John M., to Ericsson Inc. Dual band diversity antenna having parasitic radiating element. 6,040,803, Cl. 343-700.0MS.
Spallholz, Julian E.; and Reid, Ted W. Method for the preparation of free radical pharmaceuticals, diagnostics and devices using selenium conjugates. 6,040,197, Cl. 436-525.000.
Spalt, Werner: *See—*
Knebel, Joachim; and Spalt, Werner. 6,040,473, Cl. 560-217.000.
Sparta, Inc.: *See—*
Monroe, John W.; Smith, John J.; Kenyon, Stephen C.; and Anderson, Michael E., 6,040,843, Cl. 345-507.000.
Spath, Mark James, to General Motors Corporation. Hydraulic lash adjuster with plunger inner control ring. 6,039,018, Cl. 123-90.550.
Speare Tools, Inc.: *See—*
Speare, William J., 6,038,945, Cl. 81-23.000.
Speare, William J., to Speare Tools, Inc. Nail starter integrally formed in head for a hammer. 6,038,945, Cl. 81-23.000.
Spector, Donald. Animal-like ride-on toy vehicle. 6,039,327, Cl. 280-7.021.
Speedfam Co., Ltd.: *See—*
Arai, Hatsuyuki; and Ikeyama, Yasushi. 6,040,244, Cl. 438-691.000.
Nagayama, Hitoshi; and Nezu, Motoi. 6,039,638, Cl. 451-288.000.
Speier, Wolfgang: *See—*
Szot, Krzysztof; Speier, Wolfgang; and Herion, Jörg. 6,040,070, Cl. 428-700.000.
Spence, Jonathan P. Apparatus for cooking eggs. 6,038,966, Cl. 99-440.000.
Spencer, Julian A. Q., to Gateway 2000, Inc. Portable computer having folding speakers. 6,040,978, Cl. 361-683.000.
Spencer, Michael; Mumm, Rita; and Gwyn, Jeff, to Dekalb Genetics Corporation. Glyphosate resistant maize lines. 6,040,497, Cl. 800-288.000.
Spets, Timothy J.: *See—*
Erickson, Paul M.; and Spets, Timothy J., 6,041,048, Cl. 370-349.000.
Spinelli, Harry Joseph: *See—*
Page, Loretta Ann Grezzo; Spinelli, Harry Joseph; and Anton, Waifong Liew, 6,040,358, Cl. 523-161.000.
Spletzer, David. Exercise thigh weight system. 6,039,677, Cl. 482-105.000.
Sporleder, C. Ray; and Clemmer, David E., to Indiana University Advanced Research & Technology Institute Inc. Electric field generation for charged particle analyzers. 6,040,573, Cl. 250-281.000.
Sprakelaar, Gertjan van: *See—*
Maluf, Nadim I.; Logan, John R.; and Sprakelaar, Gertjan van, 6,038,928, Cl. 73-724.000.
SRI International: *See—*
Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.
Srinivas, Hosahalli R.: *See—*
Chen, Feng; Kolagotla, Ravi K.; Ly, Le T.; Mo, Jiancheng; and Srinivas, Hosahalli R., 6,041,418, Cl. 713-400.000.
Srinivasan, Anand; and Sandhu, Gurtej S., to Micron Technology, Inc. Catalytic breakdown of reactant gases in chemical vapor deposition. 6,040,010, Cl. 427-250.000.
Srinivasan, Kasturi Rangan: *See—*
Black, David Glenn; Hinch, Garry Dale; Nguyen, Dat Quoc; and Srinivasan, Kasturi Rangan, 6,040,098, Cl. 430-59.600.
Sriram, Kotikalapudi: *See—*
Doshi, Bharat Tarachand; Dravida, Subrahmanyam; Kustka, George John; Magill, Peter D.; Siller, Curtis A.; and Sriram, Kotikalapudi, 6,041,051, Cl. 370-352.000.
SSAC, Inc.: *See—*
Gluszek, Andrew, 6,040,689, Cl. 324-127.000.
SSP Co., Ltd.: *See—*
Takeda, Sunao; Kaneko, Yasushi; Tokizawa, Minoru; Eto, Hiromichi; Ishida, Kazuya; Maebashi, Kazunori; Matsumoto, Masaru; Asaoka, Takemitsu; and Sato, Susumu, 6,040,325, Cl. 514-383.000.
St. Croix Medical, Inc.: *See—*
Bushek, Donald J., 6,039,685, Cl. 600-25.000.
Stadler, Rolf, to Firma Carl Freudenberg. Sealing arrangement. 6,039,322, Cl. 277-551.000.
Staff Co., Ltd.: *See—*
Todokoro, Masatoshi, 6,039,655, Cl. 473-116.000.
Stafford, Jay M., to Fairchild Holding Corp. Nut removal and installation tool. 6,038,754, Cl. 29-267.000.
Stahl, Kermit E.; Noone, Michael J.; and Quaranta, Joseph, to CertainTeed Corporation. Stack and package of laminated shingles. 6,038,826, Cl. 52-554.000.
Stahl, Uwe: *See—*
Lautenschlager, Wolfgang; and Stahl, Uwe, 6,041,110, Cl. 379-201.000.
Stähle, Michael: *See—*
Petrick, Jörg; and Stähle, Michael, 6,039,573, Cl. 434-268.000.
Stähler, Theo. Process for the thoroughgoing aerobic biological purification of waste water. 6,039,873, Cl. 210-605.000.
Stahovic, Robert. Animal excrement collecting device and collecting tool. 6,039,369, Cl. 294-1.400.
Staiger, Wolfgang: *See—*
Becker, Klaus; Staiger, Wolfgang; Jung, Matthias; and Heinemeyer, Peter, 6,039,114, Cl. 165-170.000.
Stancil, Charles J.: *See—*
Ramsey, Jens K.; Stevens, Jeffrey C.; Tubbs, Michael E.; and Stancil, Charles J., 6,041,401, Cl. 712-43.000.
Standiford, Jocelyn D.; and Edgerle, Candius L. Time monitoring portable game system. 6,039,574, Cl. 434-304.000.
Stanford, Dean: *See—*
Hanners, John C.; Miller, Charles A.; and Stanford, Dean, 6,040,691, Cl. 324-158.100.
Stanisci, Carlo: *See—*
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Stankiewicz, Edwin P.: *See—*
Fay, Thomas F., III; La Ferla, Raffaele; Sherman, Andrew J.; and Stankiewicz, Edwin P., 6,040,266, Cl. 502-439.000.
Stanley Fastening Systems, L.P.: *See—*
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Stanley Works, The: *See—*
Snoke, Steven R.; Silvis, Gary; and Howland, Thomas E., 6,039,417, Cl. 312-257.100.
Stanssens, Patrick Eric Hugo: *See—*
Vlasuk, George Phillip; Stanssens, Patrick Eric Hugo; Messens, Joris Hilda Lieven; Lauwereys, Marc Josef; LaRoche, Yves Rene; Jespers, Laurent Stephane; Gansemans, Yannick Georges Jozef; Moyle, Matthew; and Bergum, Peter W., 6,040,441, Cl. 536-252.000.
Stanton, Stephen Millard; Davis, James Talmage, II; Dutson, Alan James; and Henderson, Gregory Lane, to Motorola, Inc. Impact resistant display apparatus. 6,040,846, Cl. 345-905.000.
Stapfer, Michael; and Fiedler, Michael, to Giesecke & Devrient GmbH. Device for optically detecting sheet material. 6,040,901, Cl. 356-71.000.
Stark, Samuel Ray. Golf bag transportation apparatus for motor vehicles. 6,039,227, Cl. 224-521.000.
Starner, Allen Richard: *See—*
Niederman, Robert Raymond; Starner, Allen Richard; and Ryan, Shawn Gregory, 6,039,348, Cl. 280-741.000.
Starostin, Dimitry M.: *See—*
Krivitski, Nikolai M.; and Starostin, Dimitry M., 6,041,246, Cl. 600-322.000.
Starzewski, Karl-Heinz Aleksander Ostoja, to Bayer Aktiengesellschaft. Nickel catalysts for polymerization. 6,040,403, Cl. 526-171.000.
STC Technologies: *See—*
Sanjurjo, Angel; Lau, Kai-Hung; Lowe, David; Canizales, Anastasia; Jiang, Naixiong; Wong, Victor; Jiang, Liqiang; Schneider, Luke V.; Mufti, Naheed; Rewick, Robert T.; Johansson, Marie; and Kardos, Keith, 6,039,894, Cl. 252-301.40R.
Steel Heddle Manufacturing Co.: *See—*
Stenhouse, William L., 6,039,088, Cl. 139-192.000.
Thompson, Robert G., III; and Stenhouse, William L., 6,039,087, Cl. 139-192.000.
Steel, Laurence M.: *See—*
Goldman, Richard B., 6,039,926, Cl. 422-116.000.
Steen, C. Raymond, Jr.: *See—*
Warther, Richard O.; and Steen, C. Raymond, Jr., 6,039,356, Cl. 283-61.000.
Stefansky, Frederick Mark: *See—*
Lindrose, Albert Michael; and Stefansky, Frederick Mark, 6,040,960, Cl. 360-105.000.
Steffan, Paul J.; and Chen, Ming Chun, to Advanced Micro Devices, Inc. Automatic recipe adjust and download based on process control window. 6,041,270, Cl. 700-121.000.
Steigerwald, Robert Louis: *See—*
Ramakrishnan, Sriram; Steigerwald, Robert Louis; and Bicknell, William Hull, 6,040,753, Cl. 336-223.000.
Stein, Alan: *See—*
Edwards, Stuart D.; Wehman, Thomas C.; Parker, Theodore L.; Kucklick, Theodore; Skalnyi, Eugene V.; and Stein, Alan, 6,039,757, Cl. 623-1.000.

Stein, Bernd; Lehnert, Heinz; Zimmermann, Wilhelm; and Steinhauer, Heinz, to Dynamit Nobel Gmbh Explosivstoff-und Systemstechnik. Method and device for producing press-rolled pipes with inner wall thickenings at the ends. 6,038,901, Cl. 72-85.000.

Stein, John P.; and Hendrickson, J. Dean. Carrier for a trailer-hitch receiver with improved pin lock. 6,039,228, Cl. 224-532.000.

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Steinbacher, David M.: *See—*
Fox, Richard H.; Steinbacher, David M.; Olin, Wesley L.; Meyers, Vernon O.; and Zimmerle, William J., 6,039,158, Cl. 188-162.000.

Steiner, Karl V.: *See—*
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Stein, Bernd; Lehnert, Heinz; Zimmermann, Wilhelm; and Steinhauer, Heinz, 6,038,901, Cl. 72-85.000.

Steinhauser, Norbert J.: *See—*
Ossian, Kenneth C.; and Steinhauser, Norbert J., 6,039,890, Cl. 252-70.000.

Steinke, Jürgen: *See—*
Rees, Jochen; and Steinke, Jürgen, 6,040,988, Cl. 363-37.000.

Steinlechner, Siegbert, to Robert Bosch GmbH. Circuit arrangement for arithmetic combination of an analog signal with a digital value and method and circuit arrangement for determination of an angle. 6,041,336, Cl. 708-4.000.

Stengl, Reinhard: *See—*
Reisinger, Hans; Grüning, Ulrike; Wendt, Hermann; Stengl, Reinhard; Lehmann, Volker; Willer, Josef; Franosch, Martin; Schäfer, Herbert; Krautschneider, Wolfgang; Hofmann, Franz; and Böhm, Thomas, 6,040,995, Cl. 365-185.180.

Stenhouse, William L., to Steel Heddle Manufacturing Co. Reed assembly with angled dents. 6,039,088, Cl. 139-192.000.

Stenhouse, William L.: *See—*
Thompson, Robert G., III; and Stenhouse, William L., 6,039,087, Cl. 139-192.000.

Stephens, Roger D.; and Schmidmeister, Erwin, to Stephens, Roger D.; and Schidmeister, Erwin. Monitor cable caddy. 6,039,280, Cl. 242-388.600.

Stephens, William D.: *See—*
Harrod, Charles E.; and Stephens, William D., 6,039,819, Cl. 149-19.200.

Stephenson, Daniel Lee: *See—*
Anderson, David C.; and Stephenson, Daniel Lee, 6,041,155, Cl. 385-139.000.

Steris Corporation: *See—*
Seifert, Raymond C.; and Bradbury, John R., 6,039,724, Cl. 604-533.000.

Stern, Roger A.; Sullivan, Vincent N.; and Marion, Robert L., to Vesta Medical, Inc. Method and apparatus for endometrial ablation. 6,041,260, Cl. 607-98.000.

Sternal, Thorsten: *See—*
Bonny, Pierre; Kreutzig, Norbert; and Sternal, Thorsten, 6,038,769, Cl. 29-890.080.

Sterner, Mark H.: *See—*
Ehlers, Jeffrey D.; and Sterner, Mark H., 6,040,503, Cl. 800-313.000.

Stevens, Dirk: *See—*
Meiler, Reinhold; and Stevens, Dirk, 6,038,761, Cl. 29-605.000.

Stevens, Jeffrey C.: *See—*
Ramsey, Jens K.; Stevens, Jeffrey C.; Tubbs, Michael E.; and Stancil, Charles J., 6,041,401, Cl. 712-43.000.

Stevens, Vernon C., to Ohio State University, The. Method for treatment of antigenically modified polypeptides. 6,039,948, Cl. 424-184.100.

Stevenson, Joseph T.: *See—*
Schilling, Jan C.; Cornell, Jay L.; and Stevenson, Joseph T., 6,039,542, Cl. 416-233.000.

Stevenson, Mark D.; and Brady, Jerry L., to Atlantic Richfield Company. Oil and gas production with periodic gas injection. 6,039,116, Cl. 166-263.000.

Stewart, David John: *See—*
Inaba, Tadanobu; Fayz, Shirin; and Stewart, David John, 6,040,434, Cl. 536-23.000.

Stewart, Francis, to European Molecular Biology Laboratory (EMBL). Nucleic acid encoding site specific recombinase and nuclear receptor fusion protein. 6,040,430, Cl. 530-358.000.

Stewart, Lansing Joseph: *See—*
Kim, Hidong; and Stewart, Lansing Joseph, 6,039,804, Cl. 117-206.000.

St. George, Peter: *See—*
Symonds, Robert D.; Singer, Irek; St. George, Peter; and Gill, Robert Bradley, 6,039,245, Cl. 235-379.000.

Stickley, Keith A.: *See—*
Pennington, Donald R.; Stickley, Keith A.; and Reesby, Cyril F., 6,038,718, Cl. 5-618.000.

Stier, Peter. Tapered steel post. 6,039,298, Cl. 248-545.000.

Stiller, Martin: *See—*
Focke, Heinz; Häfker, Thomas; Stiller, Martin; and Schlenker, Michael, 6,038,832, Cl. 53-234.000.
Focke, Heinz; and Stiller, Martin, 6,038,836, Cl. 53-462.000.

Stirling Technology, Inc.: *See—*
Chagnot, Catherine J.; and Crum, Joseph Arden, 6,039,109, Cl. 165-8.000.

STMicroelectronics, Inc.: *See—*
Hodges, Robert Louis, 6,040,233, Cl. 438-427.000.
McClure, David C.; and Youssef, Tom, 6,041,000, Cl. 365-200.000.
Patel, Viren C., 6,040,617, Cl. 257-571.000.

STMicroelectronics S.A.: *See—*
Naura, David, 6,040,994, Cl. 365-185.180.

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Frisina, Ferruccio; Bolognesi, Davide; and Magri', Angelo, 6,040,609, Cl. 257-391.000.
Pelagalli, Sergio; and Losi, Marco, 6,041,428, Cl. 714-734.000.
Pidutti, Albino; and Legnani, Marco Alessandro, 6,040,687, Cl. 323-316.000.

Stoebe, Timothy W.: *See—*
Eshelman, Lyn M.; and Stoebe, Timothy W., 6,040,131, Cl. 430-619.000.

Stoever, Harro: *See—*
Bangs, William E.; Dibenedetto, Joseph D.; Friedberg, Joyce L.; Giordano, Denise A.; Glover, Judy M.; Khoo, Chor San Heng; Ko, Sandy; MacNair, R. David C.; Noar, Scott R.; Randazzi, John J., Jr.; Stoever, Harro; and Ziegler, Paula J., 6,039,989, Cl. 426-106.000.

Stojanoff, Christo G.: *See—*
Mrosik, Jan Michael; Nagel, Joerg; and Stojanoff, Christo G., 6,040,898, Cl. 356-5.090.

Stokes, Mitchell O.: *See—*
Amos, David J.; and Stokes, Mitchell O., 6,038,861, Cl. 60-737.000.

Stoll, Kurt; Berger, Rolf; and Gebauer, Günter, to Festo AG & Co. Connecting means for two members in fluid conducting assembly. 6,039,358, Cl. 285-23.000.

Stoller Enterprises, Inc.: *See—*
Dean, Frank William, 6,040,273, Cl. 504-328.000.

Stoltz, Gregory E.: *See—*
Waters, Brian G.; Stoltz, Gregory E.; and Maldanis, Algert J., 6,039,164, Cl. 194-206.000.

Stomp, Anne-Marie; and Rajbhandari, Nirmala, to North Caroline State University. Genetically engineered duckweed. 6,040,498, Cl. 800-294.000.

Stone, Geoffrey C., to Xylan Corporation. Self-configuring ATM network. 6,041,057, Cl. 370-397.000.

Stone, Jeffrey Jay: *See—*
Davidson, Steven Frederic; Vollendorf, Kim David; DiCicco, Michael Frank; Collar, Stuart John; and Stone, Jeffrey Jay, 6,041,243, Cl. 455-575.000.

Stoner, George S.; and Schoonmaker, Peter M., to Northern Research and Engineering Corp. Inlet guide vane assembly. 6,039,534, Cl. 415-162.000.

Stoner, Stuart C.: *See—*
Clark, Stephen L.; Horchler, David C.; Stoner, Stuart C.; Pontius, Glenn J.; and Nailor, William K., III, 6,038,762, Cl. 29-739.000.

Stork R.M.S. B.V.: *See—*
Beijaard, Barend Jacobus Emmanuel; Jacobs, Thomas Gerardus Maria; and Tiggeloven, Leonardus Jozephus Antonius, 6,039,080, Cl. 138-115.000.

Storz, Karl, deceased (by Sybill Storz-Reling, executrix), to Karl Storz GmbH & Co. KG. Rectoscope with semi-reflective tube surface. 6,039,687, Cl. 600-135.000.

Storz-Reling, Sybill, executrix: *See—*
Storz, Karl, deceased, 6,039,687, Cl. 600-135.000.

Stott, Paul Edwin: *See—*
Friedman, Howard Stephen; and Stott, Paul Edwin, 6,039,895, Cl. 252-404.000.

Stowell, Davin: *See—*
Khovaylo, Modest; Puyot, Michael A.; Dow, James C.; Henderson, Scott; and Stowell, Davin, 6,040,572, Cl. 250-235.000.

Stoy, Vladimir A.: *See—*
Cooke, Randolph L.; and Stoy, Vladimir A., 6,040,493, Cl. 602-41.000.

Straayer, David H.: *See—*
Franz, Patrick J.; Biehl, Philip D.; Straayer, David H.; and Dodier, Robert H., 6,040,821, Cl. 345-159.000.

Strahilevitz, Meir. Extracorporeal affinity adsorption devices. 6,039,946, Cl. 424-140.100.

Strahl, Robert Charles. Physical endurance drink and method of preventing cramping caused by strenuous bodily activity. 6,039,987, Cl. 426-74.000.

Strähle, Roland, to Laengerer & Reich GmbH & Co. Heat store, especially latent heat store. 6,039,110, Cl. 165-10.000.

Strankman, Douglas R. Moving head gate feeding apparatus. 6,039,002, Cl. 119-57.100.

Stratagene: *See—*
Greener, Alan L.; and Jerpseth, Bruce D., 6,040,184, Cl. 435-461.000.

Straub, Kurt M.: *See—*
Paganini, Lisa M.; Casilio, Frank; Peters, Roy; Straub, Kurt M.; DeHondt, Rene C.; and Fry, Tova, 6,040,637, Cl. 307-10.100.

Streb, Holger: *See—*
Prade, Bernd; Schetter, Bernhard; and Streb, Holger, 6,038,864, Cl. 60-748.000.

Strian, Ernst: *See—*
Birkner, Stefan; Strian, Ernst; and Kreibiehl, Markus, 6,040,059, Cl. 428-469.000.

Strickland, Charles, to Alexander, Jerry; and Hofler, Sr., Kenneth L. Oil lift system. 6,039,544, Cl. 417-53.000.
Strömberg, Stefan Per Axel: *See*—
Gustafsson, Lars Erik; Persson, Gunnar Magnus Severus; and Strömberg, Stefan Per Axel, 6,038,913, Cl. 73-23.300.
Strömbom, Eva: *See*—
Kalentun, Pia; Buschka, Anette; Schmid, Andrea; and Strömbom, Eva, 6,040,494, Cl. 604-369.000.
Strong, Gary D.: *See*—
Rodgers, Kenneth W.; Strong, Gary D.; Christy, Michael C.; and Mason, Russell C., 6,039,091, Cl. 141-83.000.
Strother, Richard K.: *See*—
Hooper, James R.; Strother, Richard K.; Fish, John; Pawling, Paul G.; and Sauer, Gerald L., 6,040,397, Cl. 525-526.000.
Strotton, Carl N.: *See*—
Pooley, Michael B.; Strotton, Carl N.; and Wardle, David G., 6,038,868, Cl. 62-63.000.
Stroud, Brian: *See*—
Kennedy, Joe B.; Davyduke, Roland; Jackson, James G.; Hannebauer, James B.; Newnes, William R.; Stroud, Brian; and Sergeant, John, 6,039,097, Cl. 144-357.000.
Kennedy, Joe B.; Davyduke, Roland; Jackson, James G.; Hannebauer, James B.; Newnes, William R.; Stroud, Brian; and Sergeant, John, 6,039,098, Cl. 144-357.000.
Stroud, Toni S.: *See*—
Noe, Reginald J.; and Stroud, Toni S., 6,039,372, Cl. 294-10.000.
Strübin, Pierre, to Liaisons Electronique - Mecaniques Lem S.A. Electrical current supply device with incorporated electrical current sensor. 6,040,688, Cl. 323-368.000.
Struck, Sönke; and Holger, Ernst, to U.S. Philips Corporation. Delay device. 6,040,727, Cl. 327-277.000.
Stryker Corporation: *See*—
Keck, Peter C.; and Smart, John E., 6,040,431, Cl. 530-399.000.
Stuber, Richard L., to MCI Communications Corporation. Forecasting resource requirements for a group of removable media devices by measuring residency time and generating model. 6,041,367, Cl. 710-18.000.
Stuettler, Herbert M., to Leica Microsystems AG. Method and device for the recording and reproduction of stereoscopic video images. 6,040,852, Cl. 348-43.000.
Stuntz, Ross Maxwell; and Zaremba, Alexander Timofeevich, to Ford Global Technologies, Inc. Active engine speed pulsation damping. 6,039,028, Cl. 123-436.000.
Su, Ching-Piao: *See*—
Wu, Chung-Yu; and Su, Ching-Piao, 6,041,105, Cl. 379-93.050.
Su, Guan Hua: *See*—
Parker, Danny S.; Su, Guan Hua; and Hibbs, Bart D., 6,039,541, Cl. 416-223.00R.
Su, Ming-Chang, to Macronix International Co., Ltd. Internal arbiter for a repeater in a computer network. 6,041,061, Cl. 370-461.000.
Su, Su-Ying: *See*—
Liu, Meng-Chang; Lin, Jyh-Feng; Yen, Ming-Shu; Su, Su-Ying; Chiu, Fu-Ying; and Lin, Chien-Hung, 6,040,223, Cl. 438-303.000.
Subramanian, Kumar: *See*—
Allen, Michael P.; Ellsworth, Stoughton L.; Ensler, Lawrence M.; and Subramanian, Kumar, 6,039,868, Cl. 210-232.000.
Suenaga, Kiyoshi; Tomita, Yasuoki; and Fukuno, Hiroki, to Mitsubishi Heavy Industries, Ltd. Gas turbine blade. 6,039,531, Cl. 415-115.000.
Suetsugu, Junichi: *See*—
Hagiwara, Yoshihiro; Suetsugu, Junichi; Mizoguchi, Tadashi; Minemoto, Hitoshi; Takemoto, Hitoshi; Shima, Kazuo; and Yakushiji, Toru, 6,039,442, Cl. 347-89.000.
Suffi, Louis; and Ladd, Arnold M., to Reltec Corporation. Network interface device for line testing. 6,039,578, Cl. 439-54.000.
Suganuma, Takao: *See*—
Shimoi, Yoichi; Tamura, Hideo; Okazaki, Masaomi; and Suganuma, Takao, 6,039,879, Cl. 210-641.000.
Sugauchi, Kiminori; Hirata, Toshiaki; Nishiki, Kenya; Miyazaki, Satoshi; Mizuguchi, Keizo; and Fujino, Shuji, to Hitachi, Ltd. System management/network correspondence display method and system therefor. 6,041,349, Cl. 709-223.000.
Sugawa, Katsumi: *See*—
Yamato, Seiichi; Kamei, Noboru; Okuma, Kazuyoshi; Sugawa, Katsumi; Kadota, Hironori; and Sakata, Tomoyuki, 6,041,062, Cl. 370-465.000.
Sugawara, Akira; Hana, Yoshitake; Endo, Takayoshi; and Sugiyama, Osamu, to Dowa Mining Co., Ltd.; and Yazaki Corporation. Hard coated copper alloys. 6,040,067, Cl. 428-647.000.
Sugimoto, Hiroshi; Hagiya, Shigeo; Taketani, Noriaki; Yonemoto, Takaharu; and Yoshioka, Osamu, to Hitachi Cable, Ltd. Lead frame for LOC having a regulating lead to prevent variation in adhesive coverage. 6,040,620, Cl. 257-666.000.
Sugimoto, Kouji: *See*—
Yamamoto, Tomohiko; Tsumiyama, Tatsuo; and Sugimoto, Kouji, 6,040,418, Cl. 528-353.000.
Sugimoto, Masanori, to Shimano, In. Bicycle brake with link-adjusted brake shoes. 6,039,153, Cl. 188-24.220.
Sugimoto, Takashi; and Honaga, Kazuhiro, to Suzuki Motor Corporation. Four-wheel drive vehicle with free wheels. 6,039,138, Cl. 180-245.000.
Sugimoto, Tomohiko: *See*—
Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, 6,041,082, Cl. 375-300.000.
Sugimura, Atsurou; and Tuno, Yoshihide, to Takigen Manufacturing Co. Ltd. Door locking handle assembly of pull-out and side-swinging lever-action type. 6,039,363, Cl. 292-202.000.
Sugino, Tsukasa: *See*—
Onishi, Masanori; Murata, Masanao; Nakai, Yutaka; Yasuda, Katsumi; Sugino, Tsukasa; Nakagawa, Susumu; and Miura, Kouji, 6,041,274, Cl. 701-26.000.
Sugita, Hiroaki; and Yamamoto, Hisashi, to Toyota Jidosha Kabushiki Kaisha. Lithium ion secondary cell solvent. 6,040,091, Cl. 429-324.000.
Sugita, Takehiro, to Sony Corporation. Radio communication system and method and mobile communication terminal device. 6,041,124, Cl. 380-270.000.
Sugita, Yukihiko: *See*—
Katagiri, Moriya; Sugita, Yukihiko; and Kitahara, Yoshiyuki, 6,039,476, Cl. 396-418.000.
Sugitani, Hiroshi: *See*—
Noguchi, Hiromichi; Sugitani, Hiroshi; Koizumi, Yutaka; Inamoto, Tadayoshi; Aono, Kiyomi; and Nakata, Yoshie, 6,040,002, Cl. 427-96.000.
Sugiura, Akio: *See*—
Konosu, Koji; Sugiura, Akio; and Motizuki, Kunihiro, 6,039,256, Cl. 235-462.430.
Sugiura, Susumu, to Canon Kabushiki Kaisha. Image processing apparatus. 6,041,144, Cl. 382-239.000.
Sugiyama, Ichiro: *See*—
Kushiya, Katsumi; Okumura, Daisuke; and Sugiyama, Ichiro, 6,040,521, Cl. 136-265.000.
Sugiyama, Koichi: *See*—
Nakayama, Kazuya; and Sugiyama, Koichi, 6,040,598, Cl. 257-329.000.
Sugiyama, Mitsuhiro: *See*—
Mera, Takeshi; Endo, Satoru; and Sugiyama, Mitsuhiro, 6,040,655, Cl. 313-409.000.
Sugiyama, Osamu: *See*—
Sugawara, Akira; Hana, Yoshitake; Endo, Takayoshi; and Sugiyama, Osamu, 6,040,067, Cl. 428-647.000.
Sugiyama, Yasunori: *See*—
Miwa, Minoru; Takeno, Akiyoshi; Koike, Toshihiro; Ako, Satoshi; and Sugiyama, Yasunori, 6,040,941, Cl. 359-443.000.
Sugizaki, Yoshiki: *See*—
Kusunoki, Akihiko; Kawamura, Naohisa; Sugizaki, Yoshiki; and Kuwahara, Akio, 6,039,971, Cl. 424-443.000.
Suguro, Akihiro, to Kyocera Corporation. Portable radio communication apparatus. 6,041,220, Cl. 455-90.000.
Suiter, Harold R., to United States of America, Navy. Afocal water-air lens with greatly reduced lateral color aberration. 6,039,445, Cl. 351-43.000.
Sukigara, Akihiko: *See*—
Kaneko, Masanori; and Sukigara, Akihiko, 6,040,670, Cl. 318-561.000.
Sullivan, Carl Edmond: *See*—
Komplin, Steven Robert; Murthy, Ashok; and Sullivan, Carl Edmond, 6,039,439, Cl. 347-65.000.
Sullivan, Colin E., to University of Sydney. Gas delivery mask. 6,039,044, Cl. 128-205.250.
Sullivan, Frederic Ballou-Viaux: *See*—
Burns, Clay Allen; Nielsen, Peter Madelaire; Sullivan, John Aloysius; and Sullivan, Frederic Ballou-Viaux, 6,039,329, Cl. 280-11.190.
Sullivan, John Aloysius: *See*—
Burns, Clay Allen; Nielsen, Peter Madelaire; Sullivan, John Aloysius; and Sullivan, Frederic Ballou-Viaux, 6,039,329, Cl. 280-11.190.
Sullivan, Joseph L.; Borschowa, Lawrence A.; and Nova, Richard C., to Physio-Control Manufacturing Corporation. H-bridge circuit for generating a high-energy biphasic waveform in an external defibrillator and further including a protective component that has both inductive and resistive properties. 6,041,254, Cl. 607-5.000.
Sullivan, Vincent N.: *See*—
Stern, Roger A.; Sullivan, Vincent N.; and Marion, Robert L., 6,041,260, Cl. 607-98.000.
Sullivan, William T. Truck bed enclosure attachment posts. 6,039,521, Cl. 410-118.000.
Sumikawa, Akihiro, to Fuji Xerox Co., Ltd. Display apparatus and method for displaying windows on a display. 6,040,817, Cl. 345-113.000.
Sumitomo Bakelite Co., Ltd.: *See*—
Miyamoto, Tetsuya; and Kawata, Masakazu, 6,039,896, Cl. 252-511.000.
Sumitomo Chemical Company Limited: *See*—
Kawamura, Akira; Hasegawa, Toshiyuki; and Tanikawa, Akira, 6,039,799, Cl. 106-287.200.
Mito, Nobuaki, 6,040,270, Cl. 504-128.000.
Yako, Yuko; Takahashi, Kenji; Takagaki, Hiroshi; and Fukui, Nobuhito, 6,040,112, Cl. 430-270.100.
Sumitomo Electric Industries, Ltd.: *See*—
Tanaka, Tsutomu, 6,039,605, Cl. 439-610.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Tanaka, Hiroaki; Okido, Yoshiyuki; and Sano, Hideki, 6,039,910, Cl. 264-248.000.
Sumitomo Wiring Systems, Ltd.: *See*—
Inamori, Nobuya, 6,041,087, Cl. 375-348.000.
Tanaka, Tsutomu, 6,039,605, Cl. 439-610.000.
Wakata, Shigekazu; and Saijo, Eiji, 6,039,603, Cl. 439-587.000.
Sumiyoshi, Ken: *See*—
Takatori, Ken-Ichi; and Sumiyoshi, Ken, 6,040,889, Cl. 349-174.000.

Sumner, Terence Edward, to Motorola, Inc. Method and apparatus for reducing transmission time required to communicate a silent portion of a voice message. 6,041,227, Cl. 455-412.000.

Sun, Hsiang-Ning; and Vaughn, Stephen Neil, to Exxon Chemical Patents Inc. Use of alkaline earth metal containing small pore non-zeolitic molecular sieve catalysts in oxygenate conversion. 6,040,264, Cl. 502-214.000.

Sun Hydraulics Corp.: *See—*
Zaehe, Bernd, 6,039,070, Cl. 137-491.000.

Sun Microsystems, Inc,: *See—*
Schaffer, Daniel H., 6,041,363, Cl. 709-301.000.

Sun Microsystems, Inc.: *See—*
Pfister, Dennis M.; and Byrd, Charles M., 6,038,878, Cl. 62-259.200.
Pfister, Dennis M.; and Byrd, Charles M., 6,038,883, Cl. 62-480.000.
Watkins, John, 6,041,369, Cl. 710-35.000.
Yamauchi, Alan M., 6,041,430, Cl. 714-752.000.

Sun, Yu: *See—*
Kim, Unsoon; Liu, Yowjuang W.; and Sun, Yu, 6,040,597, Cl. 257-321.000.

Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji; Fujimoto, Masahisa; Nohma, Toshiyuki; and Nishio, Koji, to Sanyo Electric Co., Ltd. Positive electrode material for use in non-aqueous electrolyte battery, process for preparing the same, and non-aqueous electrolyte battery. 6,040,090, Cl. 429-231.950.

Sung, Chien-Min. Brazed diamond tools by infiltration. 6,039,641, Cl. 451-540.000.

Sung, Chih-Ta Star; Mattela, Venkat; Afsar, Muhammad; Singh, Balraj; and Hung, Chih-Teng, to Siemens Aktiengesellschaft. Memory activation devices and methods. 6,040,998, Cl. 365-194.000.

Sung, Kuo-Tung, to Mosel Vitelic, Inc. Method (and device) for producing tunnel silicon oxynitride layer. 6,040,216, Cl. 438-257.000.

Sunonwealth Electric Machine Industry Co., Ltd.: *See—*
Horng, Alex, 6,040,649, Cl. 310-91.000.

Sunpower, Inc.: *See—*
van der Walt, Nicholas R.; and Unger, Reuven Z., 6,038,874, Cl. 62-198.000.

Suntory Limited: *See—*
Saitoh, Masayuki; Kitajima, Yasuo; Iwasawa, Norio; Miura, Kenju; Haruyama, Munetada; and Hashino, Junko, 6,040,335, Cl. 514-460.000.

Sunvold, Gregory D.; Tetrick, Mark A.; and Reinhart, Gregory A., to Iams Company, The. Composition and method for improving clinical signs in animals with renal disease. 6,039,952, Cl. 424-195.100.

Supima Holdings Inc.: *See—*
Muser, Paul, 6,039,396, Cl. 297-214.000.

Surma, Terrance: *See—*
Leyden, Roger; and Surma, Terrance, 6,039,498, Cl. 403-61.000.

Susoeff, Michael N.: *See—*
Raaijmakers, Ivo J.; Burkhart, Chris W.; Christensen, David; and Susoeff, Michael N., 6,039,074, Cl. 137-537.000.

Suunto Oyj: *See—*
Lähteenmäki, Ari, 6,039,446, Cl. 351-43.000.

Suzuki, Akio; Yamamoto, Ei; Kitamura, Toshiyuki; and Yoshida, Hiroyoshi, to Canon Kabushiki Kaisha. Operational control device and method for an image processing apparatus. 6,041,265, Cl. 700-84.000.

Suzuki, Akira: *See—*
Ichimura, Isao; Maeda, Fumisada; Yamamoto, Kenji; Ohsato, Kiyoshi; Watanabe, Toshio; and Suzuki, Akira, 6,041,031, Cl. 369-112.000.

Suzuki, Hirokazu, to Kabushiki Kaisha Toshiba. Mobile communication system with roaming function. 6,041,231, Cl. 455-422.000.

Suzuki, Kazuo: *See—*
Matsumoto, Kenji; Suzuki, Kazuo; and Haga, Muneo, 6,040,004, Cl. 427-185.000.

Suzuki, Keitaro: *See—*
Watanabe, Yoshitane; Suzuki, Keitaro; Koyama, Yoshinari; and Iijima, Motoko, 6,040,372, Cl. 524-413.000.

Suzuki, Mitsuru, to Whitaker Corporation, The. Female electrical terminal having overstress members. 6,039,615, Cl. 439-849.000.

Suzuki Motor Corporation: *See—*
Minami, Hiromasa; Igarashi, Masaru; and Chiku, Takahiro, 6,040,080, Cl. 429-96.000.
Sugimoto, Takashi; and Honaga, Kazuhiro, 6,039,138, Cl. 180-245.000.
Takahashi, Tomoki, 6,039,391, Cl. 296-218.000.

Suzuki, Osamu: *See—*
Shinya, Keigo; Kou, Wen Long; Suzuki, Osamu; and Tetsui, Shunichi, 6,040,556, Cl. 219-133.000.

Suzuki, Shigeru: *See—*
Okabe, Takanori; Ban, Takashi; Suzuki, Shigeru; and Hirose, Tatsuya, 6,039,264, Cl. 237-12.30R.

Suzuki, Tatsuya, to Olympus Optical Co., Ltd. Camera with remote-control photography and stroboscopic photography function. 6,041,185, Cl. 396-56.000.

Suzuki, Tatsuya: *See—*
Honda, Tsutomu; Matsumoto, Hiroyuki; and Suzuki, Tatsuya, 6,041,195, Cl. 396-429.000.

Suzuki, Toshitake: *See—*
Mori, Kenichi; Ito, Katsuya; Kotani, Tooru; Suzuki, Toshitake; and Sasaki, Yasushi, 6,039,444, Cl. 347-105.000.

Suzuki, Tsutomu; Sato, Shougo; and Okabe, Yasushi, to Brother Kogyo Kabushiki Kaisha. Process unit, photosensitive member cartridge, developer cartridge, and image forming apparatus. 6,041,203, Cl. 399-111.000.

Suzuki, Yukiyoshi: *See—*
Maekawa, Kazuteru; Suzuki, Yukiyoshi; and Yanagikubo, Takeshi, 6,040,824, Cl. 345-173.000.

Suzuki, Yuuichi: *See—*
Hara, Akira; Onuma, Hiraku; Oyaizu, Hideo; Suzuki, Yuuichi; and Gasparrini, C. Robert, 6,038,731, Cl. 15-256.510.

Svejkovsky, Ulrich: *See—*
Müller, Hubert; and Svejkovsky, Ulrich, 6,038,757, Cl. 29-527.700.

Swafford, M. David; and Fenton, James M., to Tektronix, Inc. Thin profile vertically oriented probe adapter. 6,040,701, Cl. 324-754.000.

Swagelok Company: *See—*
Coonce, Richard L.; Sharghi, Aaron Safula; and Slife, Douglas Alan, 6,039,319, Cl. 277-314.000.

Swank, Ronald; and Palaniappan, Sevugan, to Tetra Laval Holdings & Finance, SA. UV radiation and vapor-phase hydrogen peroxide sterilization packaging. 6,039,922, Cl. 422-24.000.

Swanson, Gary K.; and L'Heureux, Ernest R., Jr., to Cooper Instrument Corporation. Adjustable pocket thermometer sheath assembly. 6,039,177, Cl. 206-306.000.

Swartz, Conrad Melton; and Abrams, Richard Stephen, to Somatics, Inc. Single-use oral protector especially for use in electroconvulsive therapy. 6,039,046, Cl. 128-859.000.

Sweeney, Maura A.: *See—*
Gundlach, Kurt B.; Sanchez, Luis A.; Colt, Richard L.; and Sweeney, Maura A., 6,039,793, Cl. 106-31.280.

Sweeney, Patrick John: *See—*
Paterson, Robert Ian; and Sweeney, Patrick John, 6,039,125, Cl. 173-1.000.

Sweeney, Philip: *See—*
Park, Edward H.; and Sweeney, Philip, 6,039,054, Cl. 132-321.000.

Swick, James A.: *See—*
Boekeloo, Harry F.; and Swick, James A., 6,038,774, Cl. 30-276.000.

Swingle, Karl F.: *See—*
Tomai, Mark A.; Hammerbeck, David M.; and Swingle, Karl F., 6,039,969, Cl. 424-434.000.

Swoboda, Dean P.: *See—*
Patterson, Robert; Whitmore, Rebecca E; Bowers, Debra D.; and Swoboda, Dean P., 6,038,963, Cl. 99-287.000.

Sykaluk, Laura L., to Pierce Chemical Company. Small dialysis device. 6,039,871, Cl. 210-321.710.

Symensma, Kenneth L.: *See—*
McKnight, Darwin T.; Essex, John D.; and Symensma, Kenneth L., 6,038,732, Cl. 15-414.000.

Symes, Kenneth Charles; and Mistry, Kishor Kumar, to Allied Colloids Limited. Particulate polymeric materials and their production. 6,039,900, Cl. 264-4.100.

Symonds, Robert D.; Singer, Irek; St. George, Peter; and Gill, Robert Bradley, to Diebold, Incorporated. Financial transaction processing system and method. 6,039,245, Cl. 235-379.000.

Synaptic Pharmaceutical Corporation: *See—*
Jeon, Yoon T.; and Gluchowski, Charles, 6,040,451, Cl. 548-181.000.

Synkinetics, Inc.: *See—*
Bursal, Faruk, 6,039,672, Cl. 476-36.000.

Syntex (U.S.A.): *See—*
Batcho, Andrew David; Manchand, Percy Sarwood; and Uskokovic, Milan Radoje, 6,040,461, Cl. 549-332.000.

Syntex (U.S.A.) Inc.: *See—*
Dvorak, Charles A.; Wren, Douglas L.; Fisher, Lawrence E.; Axt, Steven D.; Humphreys, Eric R.; Arzeno, Humberto B.; Beard, Colin C.; Nguyen, Sam Linh; Han, Yeun-Kwei; Roberts, Christopher R.; Lund, Jan P.; and Fatheree, Paul R., 6,040,446, Cl. 544-276.000.

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Krettek, Christian; Könemann, Bernd; Perrier, Alexandre; and Senn, Peter, 6,039,742, Cl. 606-96.000.

Synthonics, Incorporated: *See—*
Binns, Bruce W.; Price, Rodney M.; Palm, Charles S.; and Weaver, Suzanne E., 6,041,140, Cl. 382-209.000.

Szadkowski, Andrzej P.: *See—*
Bassett, Michael L.; Batterton, Gregory W.; and Szadkowski, Andrzej P., 6,039,163, Cl. 192-110.00R.

Szalay, Jozsef: *See—*
Sigmar, Axel M.; Iseli, James W.; Szalay, Jozsef; Haide, Janos; and Feszthammer, Andras A., 6,041,283, Cl. 702-16.000.

Szczepanski, Gerald; and Forsyth, John, to New Venture Gear, Inc. Shift fork/gate assembly. 6,038,938, Cl. 74-473.240.

Szekely, Alex S., to Plastek Group, The. Rotary dispenser. 6,039,483, Cl. 401-50.000.

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Szott, Michael J.: *See—*
Mockenhaupt, Martin; and Szott, Michael J., 6,039,323, Cl. 277-593.000.

Szum, David M.: *See—*
Murphy, Edward J.; Classey, Jeffrey; and Szum, David M., 6,040,357, Cl. 523-160.000.

Tabata, Yoshio: *See—*
Takashimizu, Yoshihiro; and Tabata, Yoshio, 6,040,923, Cl. 358-498.000.

Tachi-S Co., Ltd.: *See—*
Nemoto, Akira, 6,039,402, Cl. 297-411.340.

Tachibana, Hiroaki: *See*—
Okamoto, Hiroo; Hosokawa, Kyoichi; Owashi, Hitoaki; Tachibana, Hiroaki; and Noguchi, Takaharu, 6,041,161, Cl. 386-112.000.
Tachihara, Hiroyuki; Inoue, Hidemichi; and Endo, Hiroshi, to Harada Industry Co., Ltd. Beam steering antenna unit. 6,040,799, Cl. 342-357.060.
Tadahiro Ohmi: *See*—
Ohmi, Tadahiro; and Nitta, Takahisa, 6,039,814, Cl. 134-1.000.
Taguchi, Katsuhisa: *See*—
Kato, Kiichiro; Kondoh, Takeshi; Taguchi, Katsuhisa; and Takahashi, Kazuhiro, 6,040,048, Cl. 428-345.000.
Taguchi, Yoshio: *See*—
Satoh, Hiroki; Taguchi, Yoshio; and Shoyama, Noriko, 6,040,035, Cl. 428-195.000.
Tahara, Katsumi: *See*—
Yagasaki, Yoichi; and Tahara, Katsumi, 6,041,160, Cl. 386-94.000.
Tailhan-Lomont, Catherine; Erdelmeier, Irène; Moutet, Marc; Chaudiere, Jean; and Yadan, Jean-Claude, to Oxis International S.A. Aromatic diselenides and selenosulfides, their preparation and their uses, more particularly their therapeutical use. 6,040,328, Cl. 514-398.000.
Tain, Alexander C., to Advanced Micro Devices, Inc. Integrated circuit package verification. 6,041,269, Cl. 700-121.000.
Taiwan Semiconductor Manufacturing Company: *See*—
Chen, Chao-Cheng; Huang, Ming-Hsin; Tao, Hun-Jan; and Tsai, Chia-Shiung, 6,040,248, Cl. 438-725.000.
Liu, Meng-Chang; Lin, Jyh-Feng; Yen, Ming-Shu; Su, Su-Ying; Chiu, Fu-Ying; and Lin, Chien-Hung, 6,040,223, Cl. 438-303.000.
Wuu, Shou-Gwo; Chen, Lung; Yaung, Dun-Nian; and Lin, Yi-Miaw, 6,040,227, Cl. 438-382.000.
Taiwan Semiconductor Manufacturing Co., Ltd: *See*—
Hsiao, Yi Li, 6,040,585, Cl. 250-559.400.
Yang, Chie-Ming; Wang, Jih-Hwa; and Lin, Yen-Yi, 6,040,238, Cl. 438-592.000.
Tajik, Abdul Jamil: *See*—
Seward, James Bernard; and Tajik, Abdul Jamil, 6,039,693, Cl. 600-459.000.
Tajima, Satoko: *See*—
Ueda, Makoto; Shiga, Shigenori; Tajima, Satoko; and Morishita, Hideki, 6,041,091, Cl. 376-327.000.
Tak, Sung Woo: *See*—
Park, Chang Soon; Kim, Tae Geun; and Tak, Sung Woo, 6,039,248, Cl. 235-379.000.
Takada, Kazuyuki: *See*—
Isomura, Yoshinori; Yasohara, Masahiro; and Takada, Kazuyuki, 6,040,673, Cl. 318-615.000.
Takagaki, Hiroshi: *See*—
Yako, Yuko; Takahashi, Kenji; Takagaki, Hiroshi; and Fukui, Nobuhito, 6,040,112, Cl. 430-270.100.
Takagi, Shinpei: *See*—
Takahashi, Sakon; Takagi, Shinpei; Mizutani, Noriyuki; Oya, Yasuhiro; and Ishida, Haruhide, 6,040,102, Cl. 430-108.000.
Takagi, Takahiro: *See*—
Tokita, Yoshiaki; and Takagi, Takahiro, 6,040,024, Cl. 428-35.200.
Takahashi, Hideki, to Mitsubishi Denki Kabushiki Kaisha. Insulated trench semiconductor device with particular layer structure. 6,040,599, Cl. 257-330.000.
Takahashi, Kazuaki: *See*—
Minami, Itsuji; and Takahashi, Kazuaki, 6,040,612, Cl. 257-432.000.
Takahashi, Kazuhiro; Kobayashi, Toshitake; Takemoto, Masataka; Matano, Takashi; and Ono, Haruo, to Dai Nippon Printing Co., Ltd. Decorative material having abrasion resistance. 6,040,044, Cl. 428-323.000.
Takahashi, Kazuhiro, to Canon Kabushiki Kaisha. Projection exposure apparatus and device manufacturing method. 6,040,894, Cl. 355-53.000.
Takahashi, Kazuhiro: *See*—
Kato, Kiichiro; Kondoh, Takeshi; Taguchi, Katsuhisa; and Takahashi, Kazuhiro, 6,040,048, Cl. 428-345.000.
Takahashi, Kazuki: *See*—
Kobayashi, Hiromi; Nishida, Hideo; Miura, Haruo; Eino, Takashi; and Takahashi, Kazuki, 6,039,535, Cl. 415-172.100.
Takahashi, Kazuya: *See*—
Kurata, Tomoyuki; Kumano, Youichi; and Takahashi, Kazuya, 6,039,405, Cl. 301-43.000.
Takahashi, Ken: *See*—
Yamamoto, Hiroki; Naito, Takashi; Namekawa, Takashi; Takahashi, Ken; Watanabe, Masahiro; and Takeo, Noriyuki, 6,040,029, Cl. 428-64.100.
Takahashi, Kenji: *See*—
Yako, Yuko; Takahashi, Kenji; Takagaki, Hiroshi; and Fukui, Nobuhito, 6,040,112, Cl. 430-270.100.
Takahashi, Masanori: *See*—
Hiraoka, Noriyoshi; and Takahashi, Masanori, 6,039,618, Cl. 440-89.000.
Takahashi, Norio: *See*—
Kuroda, Tetsuo; Miyasaka, Matsuho; and Takahashi, Norio, 6,038,882, Cl. 62-476.000.
Takahashi, Sakon; Takagi, Shinpei; Mizutani, Noriyuki; Oya, Yasuhiro; and Ishida, Haruhide, to Fuji Xerox Co., Ltd. Electrostatic latent image developer and image forming method. 6,040,102, Cl. 430-108.000.
Takahashi, Tatsuya, to Sanyo Electric Co., Ltd. Image sensing apparatus and method for discharging dark current charge stored therein. 6,040,859, Cl. 348-243.000.
Takahashi, Tomoki, to Suzuki Motor Corporation. Hatch roof attaching construction for a T-bar roof car. 6,039,391, Cl. 296-218.000.
Takahashi, Tomomi: *See*—
Odashima, Hisao; Takahashi, Tomomi; and Shimizu, Toshiyuki, 6,040,054, Cl. 428-413.000.
Takahashi, Toshiki: *See*—
Hasshi, Suehiro; and Takahashi, Toshiki, 6,039,386, Cl. 296-185.000.
Takahashi, Yasuhiro; and Fukui, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Combustion state detecting apparatus for an internal-combustion engine. 6,040,698, Cl. 324-399.000.
Takai, Hideyuki: *See*—
Tanaka, Masato; Takai, Hideyuki; and Nakata, Kouichi, 6,040,100, Cl. 430-72.000.
Takai, Hisashi: *See*—
Tsuji, Tomoko; Takai, Hisashi; and Goda, Hiroki, 6,039,555, Cl. 425-362.000.
Takaishi, Yoshihiro, to NEC Corporation. Method of manufacturing semiconductor device including memory cell having transistor. 6,040,215, Cl. 438-253.000.
Takamatsu, Risuke; and Kimura, Seiichi, to Robert Bosch GmbH. Gas supply valve for gas-powered vehicle. 6,039,300, Cl. 251-129.120.
Takamori, Hiroki; and Morisige, Takayuki, to Matsushita Electric Industrial Co., Ltd. Device for synchronizing data processing. 6,041,067, Cl. 370-514.000.
Takanashi, Hidehiko: *See*—
Yasuda, Akio; Nito, Keiichi; Matsui, Eriko; Takanashi, Hidehiko; and Bao, Yang Ying, 6,040,884, Cl. 349-129.000.
Takano, Syoichi: *See*—
Ogawa, Kazuyuki; Tanaka, Kazuya; Nagata, Kinya; and Takano, Syoichi, 6,040,426, Cl. 530-350.000.
Takasago International Corporation: *See*—
Miyano, Sotaro; Hattori, Tetsutaro; Uesugi, Osamu; Tamai, Yasufumi; and Sayo, Noboru, 6,040,465, Cl. 549-510.000.
Takashimizu, Yoshihiro; and Tabata, Yoshio, to Fujitsu Limited. Transfer control apparatus for optical image reading apparatus. 6,040,923, Cl. 358-498.000.
Takasu, Hiroaki: *See*—
Hayashi, Yutaka; Kamiya, Masaaki; Kojima, Yoshikazu; and Takasu, Hiroaki, 6,040,200, Cl. 438-30.000.
Takata, Hidekazu: *See*—
Miyamoto, Yasuo; and Takata, Hidekazu, 6,041,015, Cl. 365-236.000.
Takatori, Ken-Ichi; and Sumiyoshi, Ken, to NEC Corporation. Liquid crystal display with continuous grayscale, wide viewing angle, and exceptional shock resistance. 6,040,889, Cl. 349-174.000.
Takaya, Toshihiko: *See*—
Ishiguro, Yasuyuki; Sanada, Yoshiaki; Takaya, Toshihiko; Kimura, Takahiko; Kaneshige, Masatoshi; and Yamamoto, Shuuhei, 6,041,207, Cl. 399-275.000.
Takayama, Kuniharu: *See*—
Koshiba, Takeshi; Matsuoka, Masahiro; and Takayama, Kuniharu, 6,040,840, Cl. 345-441.000.
Takeda, Arihiro: *See*—
Koike, Yoshio; Ohmuro, Katsufumi; Sasaki, Takahiro; and Takeda, Arihiro, 6,040,885, Cl. 349-129.000.
Takeda Chemical Industries, Inc.: *See*—
Nishikawa, Kohei; Shibouta, Yumiko; and Kubo, Keiji, 6,040,324, Cl. 514-381.000.
Takeda, Haruo; Tatsumi, Yukio; Fujitani, Ikuji; Shioda, Takuya; Yoshimi, Tomofumi; Sugimoto, Tomohiko; and Haeiwa, Kazuhisa, to NEC Corporation; and Nippon Hoso Kyokai. Digital amplitude modulation amplifier and television broadcasting machine. 6,041,082, Cl. 375-300.000.
Takeda, Sunao; Kaneko, Yasushi; Tokizawa, Minoru; Eto, Hiromichi; Ishida, Kazuya; Maebashi, Kazunori; Matsumoto, Masaru; Asaoka, Takemitsu; and Sato, Susumu, to SSP Co., Ltd. Triazole derivative or salt thereof preparation process thereof, and pharmaceutical containing said compound as an effective ingredient. 6,040,325, Cl. 514-383.000.
Takehara, Isamu: *See*—
Kawawada, Naoki; Namiki, Hiroaki; Takehara, Isamu; Iwaki, Tadao; Ishida, Takashi; Hayashizaki, Shinichi; Shimaguchi, Hirotada; and Konno, Katsushige, 6,040,648, Cl. 310-90.000.
Takehara, Nobuyuki; Shimoda, Kazuhisa; and Morishita, Yasuo, to Rhythm Corporation. Method of manufacturing tie rod bar for steering linkage of motor vehicle. 6,038,771, Cl. 29-897.200.
Takemasa, Takao: *See*—
Damme, Eric; Gilson, Jean-Marc; Leempoel, Patrick; Lebecq, Fabrice; and Takemasa, Takao, 6,040,412, Cl. 528-34.000.
Takemoto, Hitoshi: *See*—
Hagiwara, Yoshihiro; Suetsugu, Junichi; Mizoguchi, Tadashi; Minemoto, Hitoshi; Takemoto, Hitoshi; Shima, Kazuo; and Yakushiji, Toru, 6,039,442, Cl. 347-89.000.
Takemoto, Masami: *See*—
Inoue, Hideya; and Takemoto, Masami, 6,041,184, Cl. 396-51.000.
Takemoto, Masataka: *See*—
Takahashi, Kazuhiro; Kobayashi, Toshitake; Takemoto, Masataka; Matano, Takashi; and Ono, Haruo, 6,040,044, Cl. 428-323.000.
Takemoto, Yasunori: *See*—
Monoi, Takashi; Yamamoto, Masakazu; Torigoe, Hidenobu; and Takemoto, Yasunori, 6,040,399, Cl. 526-106.000.
Takenaka, Mitsuhiko: *See*—
Fukushima, Hirotaka; and Takenaka, Mitsuhiko, 6,039,651, Cl. 464-98.000.
Takeno, Akiyoshi: *See*—
Miwa, Minoru; Takeno, Akiyoshi; Koike, Toshihiro; Ako, Satoshi; and Sugiyama, Yasunori, 6,040,941, Cl. 359-443.000.

Takenouchi, Kenji; Hamamoto, Tomoki; and Noguchi, Toshitada, to Yamasa Corporation. Process for preparing sugar nucleotide. 6,040,158, Cl. 435-89.000.

Takeo, Noriyuki: *See*—
Yamamoto, Hiroki; Naito, Takashi; Namekawa, Takashi; Takahashi, Ken; Watanabe, Masahiro; and Takeo, Noriyuki, 6,040,029, Cl. 428-64.100.

Takeshita, Naoki; Kusano, Manabu; Sagawa, Fumihiko; and Nakagawa, Taizo, to Alps Electric Co., Ltd. Flexible substrate. 6,040,529, Cl. 174-254.000.

Taketani, Noriaki: *See*—
Sugimoto, Hiroshi; Hagiya, Shigeo; Taketani, Noriaki; Yonemoto, Takaharu; and Yoshioka, Osamu, 6,040,620, Cl. 257-666.000.

Takeuchi, Haruyuki, to Murata Manufacturing Co., Ltd. Protection device for communication. 6,040,972, Cl. 361-119.000.

Takeuchi, Yoshie: *See*—
Narita, Keishi; Ishida, Chika; Takeuchi, Yoshie; Ohto, Chikara; Ohnuma, Shinichi; and Nishino, Tokuzo, 6,040,165, Cl. 435-193.000.

Takeuchi, Yoshiharu; Aburaya, Kiyoji; Yasu, Toshiharu; Tsubokawa, Masahiro; Sakai, Manabu; Aoshika, Shoji; and Narita, Tsutayoshi, to Matsushita Electric Industrial Co., Ltd. Gear pump for use in an electrically-operated sealed compressor. 6,039,551, Cl. 418-88.000.

Taki, Keishi; and Yanagi, Yutaka, to Kabushiki Kaisha Toshiba. TIG welding method and welding apparatus. 6,040,545, Cl. 219-75.000.

Takigen Manufacturing Co. Ltd.: *See*—
Sugimura, Atsurou; and Tuno, Yoshihide, 6,039,363, Cl. 292-202.000.

Takiguchi, Masahiro, to Jatco Corporation. Automatic transmission upshift control apparatus. 6,041,275, Cl. 701-55.000.

Takimoto, Minoru, to Fujitsu Limited. Network management system based upon managed objects. 6,041,350, Cl. 709-223.000.

Takubo, Yoneharu, to Matsushita Electric Industrial Co., Ltd. Active matrix liquid crystal display device and a method for driving the same. 6,040,813, Cl. 345-92.000.

Talaski, Edward J.: *See*—
Ley, Wayne A.; Mroczka, David E.; and Talaski, Edward J., 6,039,548, Cl. 417-313.000.

Talley, David B.: *See*—
Cech, Leonard S.; Sewell, Michael R.; Gillis, Edward J.; and Talley, David B., 6,039,345, Cl. 280-735.000.

Talley, Laroul J.; Yurek, Theodore F.; Ziegler, Douglas D.; and Robinson, Ross G., to Babcock & Wilcox Company, The. Intrados induction heating for tight radius rotary draw bend. 6,038,902, Cl. 72-128.000.

Tam, Herrick: *See*—
Chou, Marilyn M.; Tam, Herrick; Yu, King J. J.; and Yu, Ken T., 6,039,565, Cl. 433-29.000.

Tamagaki, Akira; Shimazawa, Yoichi; Matsuda, Hideo; and Yoshiura, Syoichiro, to Sharp Kabushiki Kaisha. Color image forming apparatus. 6,040,924, Cl. 358-523.000.

Tamai, Yasufumi: *See*—
Miyano, Sotaro; Hattori, Tetsutaro; Uesugi, Osamu; Tamai, Yasufumi; and Sayo, Noboru, 6,040,465, Cl. 549-510.000.

Tamari, Yehuda. Inline extracorporeal reservoir and pressure isolator. 6,039,078, Cl. 138-30.000.

Tamura, Akihiro; Sakaue, Shigeo; and Hamasaki, Takeshi, to Matsushita Electric Industrial Co., Ltd. Imaging apparatus for supplying images with rich gradation across the entire luminance range for all subject types. 6,040,860, Cl. 348-252.000.

Tamura, Hideo: *See*—
Shimoi, Yoichi; Tamura, Hideo; Okazaki, Masaomi; and Suganuma, Takao, 6,039,879, Cl. 210-641.000.

Tan, Leng Leng: *See*—
Waddington, William H.; Tan, Leng Leng; and Grewell, Patricia, 6,041,384, Cl. 710-200.000.

Tan, Lushi: *See*—
Pierce, Michael E.; Chen, Cheng Y.; Choudhury, Anusuya; Radesca, Lilian A.; Tan, Lushi; and Zhao, Dalian, 6,040,480, Cl. 564-390.000.

Tan, Manuel L.: *See*—
Chung, Kenny; Keeler, Tracy N.; and Tan, Manuel L., 6,039,960, Cl. 424-401.000.

Tan, Yew-Koon: *See*—
Ozcelik, Taner; Gadre, Shirish; and Tan, Yew-Koon, 6,041,400, Cl. 712-35.000.

Tanaka, Atsushi: *See*—
Yoshimura, Yuichiro; Tanaka, Atsushi; Yanagisawa, Ryozo; Kobayashi, Katsuyuki; and Sato, Hajime, 6,041,284, Cl. 702-56.000.

Tanaka Chemical Corporation: *See*—
Junichi, Imaizumi; Yuri, Kawasaki; Tetsushi, Makino; and Toyoshi, Iida, 6,040,007, Cl. 427-215.000.

Tanaka, Hiroaki; Okido, Yoshiyuki; and Sano, Hideki, to Sumitomo Rubber Industries, Ltd. Golf ball and manufacturing method of golf ball core. 6,039,910, Cl. 264-248.000.

Tanaka, Hiroaki; Sasaki, Yutaka; and Hashimoto, Takuya, to Murata Manufacturing Co., Ltd. Unbalanced-to-balanced converter. 6,040,745, Cl. 333-26.000.

Tanaka, Junichi; Miyoshi, Kunio; and Yamashita, Sensuke, to Tanaka, Junichi; Miyoshi, Kunio; and Yamashita, Sensuke. Catheter. 6,039,723, Cl. 604-532.000.

Tanaka, Kazuya: *See*—
Ogawa, Kazuyuki; Tanaka, Kazuya; Nagata, Kinya; and Takano, Syoichi, 6,040,426, Cl. 530-350.000.

Tanaka, Masahiro: *See*—
Hayashi, Motohiko; and Tanaka, Masahiro, 6,040,921, Cl. 358-434.000.

Tanaka, Masakazu: *See*—
Arimori, Susumu; Seko, Masahiro; Tanaka, Masakazu; Monden, Noriko; and Yokota, Hideyuki, 6,040,415, Cl. 528-71.000.

Tanaka, Masanobu; and Imanaka, Hideyuki, to Exedy Corporation. Twin-clutch device. 6,039,161, Cl. 192-70.180.

Tanaka, Masato; Takai, Hideyuki; and Nakata, Kouichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, process cartridge and electrophotographic apparatus. 6,040,100, Cl. 430-72.000.

Tanaka, Shigeaki: *See*—
Ohmi, Tadahiro; Yamaji, Michio; Shinohara, Tsutomu; Itoi, Shigeru; Hirao, Keiji; Kawano, Yuji; Tanaka, Shigeaki; Yokoyama, Kosuke; Morokoshi, Hiroshi; and Ikeda, Nobukazu, 6,039,360, Cl. 285-61.000.

Tanaka, Sumio: *See*—
Atsumi, Shigeru; and Tanaka, Sumio, 6,041,014, Cl. 365-230.060.

Tanaka, Tetsuya; Tsuzuki, Koichi; Nishijima, Noriyo; Handa, Fumitaka; and Nakadaira, Shiro, to Hitachi, Ltd. Fluidized bed filtering apparatus. 6,039,866, Cl. 210-136.000.

Tanaka, Toshizumi: *See*—
Sakamoto, Toshio; Tanaka, Toshizumi; Itoi, Hiromu; and Yoshihara, Masatoshi, 6,039,695, Cl. 600-459.000.

Tanaka, Tsutomu, to Harness Systems Technologies Research, Ltd.; Sumitomo Wiring Systems, Ltd.; and Sumitomo Electric Industries, Ltd. Shield connector with enhanced insulation of a shield shell. 6,039,605, Cl. 439-610.000.

Tanaka, Tsutomu; Kelkar, Mukul; Fairbairn, Kevin; Ponnekanti, Hari; and Cheung, David, to Applied Materials, Inc. Apparatus and methods for upgraded substrate processing system with microwave plasma source. 6,039,834, Cl. 156-345.000.

Tandem Computers Incorporated: *See*—
Skarpelos, Michael J.; van der Linden, Robbert; Carley, William J.; Lyon, James M.; and McCline, Matthew C., 6,041,420, Cl. 714-7.000.

Tang, Li-Juan: *See*—
Mehra, Dev K.; Ramireddy, Chittamuru; Tang, Li-Juan; and Porter, Stuart C., 6,039,976, Cl. 424-480.000.

Tang, Ping-Wah; Lussier, Barbara B.; and Cowan, Stanley W., to Eastman Kodak Company. Photographic yellow dye-forming couplers. 6,040,126, Cl. 430-557.000.

Tanghe, Steven J., to International Business Machines Corporation. High speed write driver for magnetic inductive write head using a half-switched H-driver. 6,040,954, Cl. 360-68.000.

Taniguchi, Hideyuki: *See*—
Matsushita, Masanao; and Taniguchi, Hideyuki, 6,040,120, Cl. 430-347.000.

Taniguchi, Kazuo: *See*—
Yamaguchi, Yuji; Yoshimori, Masaharu; Ozawa, Hiroyuki; Iida, Ryohei; and Taniguchi, Kazuo, 6,040,844, Cl. 345-518.000.

Tanikawa, Akira: *See*—
Kawamura, Akira; Hasegawa, Toshiyuki; and Tanikawa, Akira, 6,039,799, Cl. 106-287.200.

Tanoue, Katsumi, to NEC Corporation. Channel assignment method in mobile communications system. 6,041,238, Cl. 455-452.000.

Tao, Hun-Jan: *See*—
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Kanazawa, Hiromichi; Ueda, Kunihiro; Yanagiuchi, Katsuaki; Ikarashi, Tsunehiko; and Kohno, Masahide, 6,040,052, Cl. 428-408.000.
Kanazawa, Kiyosumi; and Nakagawa, Yoshiro, 6,040,962, Cl. 360-113.000.
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Morooka, Hisao; Miura, Takamitsu; Yamada, Hiroshi; Kurihara, Katsuki; Matsuse, Mitsutaka; and Arai, Yasuyuki, 6,040,520, Cl. 136-245.000.
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Braunberger, Benjamin A., 6,038,944, Cl. 79-4.000.
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Walker, Jay S.; Case, T. Scott; Hartmann, Tracy; and Tedesco, Daniel E., 6,041,308, Cl. 705-14.000.
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Huang, Chung-Chen, 6,039,103, Cl. 156-511.000.
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Denton, Claude; Kirkpatrick, Donald C.; and Peters, Samuel J., 6,041,043, Cl. 370-254.000.
Swafford, M. David; and Fenton, James M., 6,040,701, Cl. 324-754.000.
Titterington, Donald R.; and Banning, Jeffery H., 6,039,794, Cl. 106-31.290.
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Huber, Thomas; and Dürrwaechter, Martin, 6,039,288, Cl. 244-118.100.
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Telecordia Technologies, Inc.: *See*—
Carman, David; Dalal, Siddhartha R.; Jain, Ashish; and Karunanithi, Nachimuthu, 6,041,330, Cl. 707-101.000.
Telect, Inc.: *See*—
Werner, William R., 6,038,766, Cl. 29-876.000.
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Martucci, Norman S.; and Mathew, Boney A., 6,039,084, Cl. 138-137.000.
Wheeler, Douglas J., 6,038,939, Cl. 74-473.300.
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Björklid, Anders; Hardie, Malcolm; and Mäder, Heinz, 6,040,743, Cl. 331-57.000.
Diachina, John W.; Persson, Bengt; Raith, Alex K.; and Sammarco, Anthony J., 6,041,047, Cl. 370-347.000.
Ginell, Thomas; Thorsell, Lars; and Lindman, Per, 6,040,639, Cl. 307-44.000.
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Jellema, Bart; Peeren, René; Croughan, Louise; and Aben, Freek, 6,041,115, Cl. 379-230.000.
Niska, Håkan; Kvarnström, Bo; and Oom, Jan, 6,041,228, Cl. 455-419.000.
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Teles, Joaquim Henrique: *See*—
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Chooi, Kon Hing; Lim, Ka Tiek; and Teoh, Ping Chow, 6,039,512, Cl. 406-85.000.
Tepro Machine & Pac-System Aktiebolag: *See*—
Persson, Curt, 6,039,529, Cl. 414-627.000.
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Teran, Alfredo J.; Derrick, John R., Jr.; Samad, Nidal A.; Willoughby, W. Todd; and Wood, Richard G., to AJT & Associates, Inc. Apparatus and method for purification of agricultural animal waste. 6,039,874, Cl. 210-605.000.
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Texas Instruments Incorporated: *See*—
Anthony, John Mark; Wallace, Robert M.; Wei, Yi; and Wilk, Glen, 6,040,230, Cl. 438-398.000.
Baudouin, Daniel; Russell, Ernest J.; and Janzen, Jeffrey W., 6,040,983, Cl. 361-760.000.
Blake, Terence G. W.; Andresen, Bernhard H.; and Wall, Frederick G., 6,040,708, Cl. 326-33.000.
Bosshart, Patrick W., 6,040,716, Cl. 326-98.000.
Brito, Joao Carlos F.; Rote, John K.; Trafton, Frederick W.; and Martins, Marcus M., 6,040,671, Cl. 318-603.000.
Chan, Min Yu; and Goh, Jing Sua, 6,040,623, Cl. 257-692.000.
Duvvury, Charvaka; Amerasekera, E. Ajith; and Ramaswamy, Sridhar, 6,040,968, Cl. 361-56.000.
Head, Claude D., III, 6,039,168, Cl. 198-341.070.
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Hynecek, Jaroslav, 6,040,569, Cl. 250-208.100.
Malhi, Satwinder D. S., 6,040,811, Cl. 345-87.000.
Pettitt, Gregory S.; and Markandey, Vishal, 6,040,876, Cl. 348-624.000.
Provence, John D., 6,041,371, Cl. 710-58.000.
Shiell, Jonathan H., 6,041,176, Cl. 395-500.480.
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Watanabe, Hideo; Sakai, Motohiro; and Tezuka, Hirofusa, 6,038,865, Cl. 62-3.600.
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Sladek, David T., 6,039,042, Cl. 128-200.230.
Thedens, John R., to Rockwell Collins, Inc. Open system modular electronics architecture. 6,041,035, Cl. 370-217.000.
Theders, John B. Finished swimming caps, and compositions and methods for producing same. 6,040,365, Cl. 524-47.000.
Themar, Charles E. Aquatic habit extension device. 6,039,005, Cl. 119-249.000.
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Thibout, Paul: *See*—
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Thio, Tineke: *See*—
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Thomas, Albert V.: *See*—
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Thomas & Betts International, Inc.: *See*—
Hauver, Bruce C., Sr.; Locati, Ronald P.; and Massaglia, Larry Michael, 6,039,609, Cl. 439-668.000.
Thomas, Daniel: *See*—
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Thomas, Jackie K., to Omni International, Inc. Folding wardrobe. 6,039,418, Cl. 312-258.000.
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Thomas, Jijimon Kumpukkattu: *See*—
Koshy, Jacob; Thomas, Jijimon Kumpukkattu; Kurian, Jose; Yadava, Yogendra Prasad; and Damodaran, Alathoor Damodaran, 6,040,275, Cl. 505-471.000.
Thomas, John H., III: *See*—
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Thomas, M. Teresa: *See*—
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Thomas, Robert McLaren, to Nortel Networks Corporation. High level diode mixer. 6,041,223, Cl. 455-326.000.
Thompson, Robert G., III; and Stenhouse, William L., to Steel Heddle Manufacturing Co. Reed assembly. 6,039,087, Cl. 139-192.000.
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Porter, John D.; Weber, Larren G.; and Thompson, William N., 6,040,713, Cl. 326-83.000.
Thomson Consumer Electronics, Inc.: *See*—
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Danzyger, Howard L.; Brow, Karenann; Caruso, James; Hibbard, Timothy; McPhilliamy, Steven; and Thuma, Michael, 6,039,292, Cl. 248-118.500.
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Toga, James E., to Intel Corporation. Method for transferring data between a network of computers dynamically based on tag information. 6,041,355, Cl. 709-227.000.
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Matsuyama, Shigeru; Asuma, Hiroaki; Shimura, Masato; Tomita, Yoshifumi; and Aratani, Sukekazu, 6,040,887, Cl. 349-141.000.

Tompkins, Eugene. Magnetic switch for automotive security system. 6,040,762, Cl. 340-426.000.

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Tonegawa, Takeshi: *See*—
Itoh, Shigeo; Makita, Yoshio; Tonegawa, Takeshi; Hirata, Yoshihiko; and Kadowaki, Akira, 6,039,620, Cl. 445-25.000.

Toner, Eugene M., to Kulicke & Soffa Investments, Inc. Missing wire detector. 6,039,234, Cl. 228-4.500.

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Glover, Shedric Oneal; Lee, Chi-long; and Tong, Wen-hong, 6,040,353, Cl. 522-15.000.

Tonkin, John Phillip: *See*—
Cullen, Michael John; Tonkin, John Phillip; and Ferch, Eric Blaine, 6,039,023, Cl. 123-339.230.

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Doi, Ichiro; and Tonomura, Shoichiro, 6,041,096, Cl. 378-48.000.

Top Power Supply Cord Set Co, Limited: *See*—
Cheung, Tat Kwong, 6,039,607, Cl. 439-622.000.

Toppan Printing Co., Ltd.: *See*—
Andoh, Tomio; Shibata, Shiro; and Marugame, Tomoyuki, 6,039,480, Cl. 400-662.000.

Toray Industries, Inc.: *See*—
Ichioka, Ryoji; Yamakawa, Shinobu; Okino, Hirohito; Kato, Hajime; Iwayama, Kazuyoshi; Konta, Hiroshi; and Kitamura, Akira, 6,040,490, Cl. 585-475.000.

Torigoe, Hidenobu: *See*—
Monoi, Takashi; Yamamoto, Masakazu; Torigoe, Hidenobu; and Takemoto, Yasunori, 6,040,399, Cl. 526-106.000.

Toro Company, The: *See*—
Comer, Robert C.; and Scherbring, David J., 6,038,989, Cl. 111-123.000.
Grundy, Michael J.; and Wright, James T., 6,039,268, Cl. 239-73.000.

Torpey, Peter A.: *See*—
Andrews, John R.; Torpey, Peter A.; Burke, Cathie J.; and Freire, Eduardo M., 6,039,436, Cl. 347-62.000.

Toshiba Battery Co., Ltd.: *See*—
Hikata, Seiichi; and Toyota, Natsuki, 6,040,083, Cl. 429-169.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Honda, Hirohiko; and Kato, Yoshinobu, 6,040,666, Cl. 318-276.000.

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Nitta, Satoru; and Mizunuma, Koji, 6,039,904, Cl. 264-40.500.

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Saito, Takahiko; Nakanishi, Akira; Obayashi, Shunzi; Genda, Kyoji; and Toshikage, Hideki, 6,041,191, Cl. 396-311.000.

Total Battery Management, Inc.: *See*—
Tsenter, Boris; and Golod, Mikhail, 6,040,685, Cl. 320-160.000.

Toth, Cynthia A.: *See*—
Walker, William F.; Toth, Cynthia A.; and Davidsen, Richard E., 6,039,691, Cl. 600-452.000.

Toukhy, Medhat A.: *See*—
Blakeney, Andrew J.; Medina, Arturo N.; Toukhy, Medhat A.; Ferreira, Lawrence; Jeffries, Alfred T., III; and Naiini, Ahmad A., 6,040,107, Cl. 430-165.000.

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Towers, Kenneth Scott; McClain, Richard Becker; and Mackiewicz, John e., to Robert Bosch Technology Corporation. Control apparatus for a brake booster. 6,038,857, Cl. 60-422.000.

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Flanders, John A.; Ready, David C.; Van Seters, Steven; Schwartz, Leonard; and Townsend, William D., 6,041,058, Cl. 370-401.000.

Toya, Shoichi; and Kokuga, Toshiharu, to Sanyo Electric Co., Ltd. Rechargeable battery pack and charging stand for charging the rechargeable battery pack by electromagnetic induction. 6,040,680, Cl. 320-108.000.

Toyama, Akira: *See*—
Yamazaki, Motohiro; Ando, Shuichi; and Toyama, Akira, 6,041,291, Cl. 702-191.000.

Toyama, Nobuaki, to Fuji Photo Optical Co., Ltd. Three-group zoom lens having a first positive refracting lens group, a second positive refracting lens group and a third negative refracting lens group. 6,040,948, Cl. 359-689.000.

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Kitagawa, Tooru; and Ishitobi, Michio, 6,040,050, Cl. 428-364.000.
Mori, Kenichi; Ito, Katsuya; Kotani, Tooru; Suzuki, Toshitake; and Sasaki, Yasushi, 6,039,444, Cl. 347-105.000.
Odashima, Hisao; Takahashi, Tomomi; and Shimizu, Toshiyuki, 6,040,054, Cl. 428-413.000.

Toyo Denso Kabushiki Kaisha: *See*—
Masuda, Kenichi; Hasegawa, Tsutomu; and Teramoto, Fuminori, 6,040,659, Cl. 315-56.000.

Toyo Engineering Corporation: *See*—
Michiki, Hideyuki; Miyakawa, Hisashi; and Ohsaki, Kozo, 6,041,272, Cl. 700-266.000.

Toyo Kasei Kogyo Company Limited: *See*—
Koguro, Kiyoto; Oga, Toshikazu; Tokunaga, Norihito; Mitsui, Sunao; and Orita, Ryozo, 6,040,454, Cl. 548-253.000.

Toyobo Co., Ltd.: *See*—
Arimori, Susumu; Seko, Masahiro; Tanaka, Masakazu; Monden, Noriko; and Yokota, Hideyuki, 6,040,415, Cl. 528-71.000.

Toyoda, Eiji: *See*—
Shirai, Seiichirou; Onozuka, Toshihiko; Noishiki, Takayuki; Sakai, Satoshi; Sasajima, Katsuhiro; Toyoda, Eiji; and Namikawa, Makoto, 6,040,110, Cl. 430-258.000.

Toyoda Gosei Co., Ltd.: *See*—
Koide, Norikatsu; Asami, Shinya; Umezaki, Junichi; Koike, Masayoshi; Yamasaki, Shiro; and Nagai, Seiji, 6,040,588, Cl. 257-15.000.
Okita, Tomoaki; Nakashima, Katsumi; Mizushima, Takashi; and Wadaki, Takeru, 6,040,351, Cl. 521-140.000.

Toyoda, Osamu: *See*—
Kosaka, Tadayoshi; Toyoda, Osamu; and Namiki, Fumihiro, 6,039,622, Cl. 445-52.000.

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Toyoshi, Iida: *See*—
Junichi, Imaizumi; Yuri, Kawasaki; Tetsushi, Makino; and Toyoshi, Iida, 6,040,007, Cl. 427-215.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Narita, Keishi; Ishida, Chika; Takeuchi, Yoshie; Ohto, Chikara; Ohnuma, Shinichi; and Nishino, Tokuzo, 6,040,165, Cl. 435-193.000.
Otsuka, Yukio; and Ozaki, Motoaki, 6,040,094, Cl. 430-5.000.
Shirai, Kenji; Yokoyama, Seiya; and Oota, Tsutomu, 6,040,665, Cl. 318-14.000.
Sugita, Hiroaki; and Yamamoto, Hisashi, 6,040,091, Cl. 429-324.000.
Terai, Tadayoshi; Hitomi, Yoshinori; Okano, Masayuki; and Kinoshita, Kazutoshi, 6,038,728, Cl. 15-250.201.

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Hikata, Seiichi; and Toyota, Natsuki, 6,040,083, Cl. 429-169.000.

Tozu, Kenji; Itoh, Takayuki; Fukami, Masanobu; and Yokoyama, Satoshi, to Aisin Seiki Kabushiki Kaisha. Brake control system for a vehicle. 6,039,411, Cl. 303-116.100.

Traber, Bruno: *See*—
Pfander, Hanspeter; and Traber, Bruno, 6,040,475, Cl. 560-264.000.

Trafton, Frederick W.: *See*—
Brito, Joao Carlos F.; Rote, John K.; Trafton, Frederick W.; and Martins, Marcus M., 6,040,671, Cl. 318-603.000.

Tran, Jimmy Cuong: *See*—
Davidovici, Sorin; Tran, Jimmy Cuong; and Kanterakis, Emmanuel, 6,041,073, Cl. 375-148.000.

Transfusion Technologies Corporation: *See*—
Headley, Thomas D.; and Powers, Edward T., 6,039,711, Cl. 604-4.000.

Transgene S.A.: *See*—
Imler, Jean-Luc; Mehtali, Majid; and Pavirani, Andréa, 6,040,174, Cl. 435-325.000.

Transneuronix, Inc.: *See*—
Cigaina, Valerio; and Jenkins, David, 6,041,258, Cl. 607-40.000.
Transonic Systems, Inc.: *See*—
Krivitski, Nikolai M.; and Starostin, Dimitry M., 6,041,246, Cl. 600-322.000.
Traub, Zeno P., to Eaton Leonard, Inc. Dual headed bending machine. 6,038,903, Cl. 72-149.000.
Trautmann, Günther-Heinrich: *See*—
Link, Helmut Friedrich; and Trautmann, Günther-Heinrich, 6,038,948, Cl. 82-147.000.
Tredegar Corporation: *See*—
Ghiam, Farid F.; and DiPoto, James P., 6,040,046, Cl. 428-343.000.
Tremblay, Clement, to Tri Tool Inc. Quick return feed for machine tool. 6,038,947, Cl. 82-113.000.
Tremco Incorporated: *See*—
Dunaway, James H.; Hernandez, Pamela K.; and Bidinger, Gregory P., 6,040,380, Cl. 524-832.000.
Trepel, Jane: *See*—
Myers, Charles; Trepel, Jane; Kang, Won Ki; Whitesell, Luke; and Neckers, Len, 6,040,334, Cl. 514-460.000.
Tri Tool Inc.: *See*—
Tremblay, Clement, 6,038,947, Cl. 82-113.000.
Triangle Package Machinery Company: *See*—
Linkiewicz, John M., 6,038,839, Cl. 53-551.000.
Tricon Industries, Incorporated: *See*—
Paul, Donald C.; Bennett, Joseph C.; Bettini, Joseph A.; and Gordon, Edward J., 6,039,579, Cl. 439-56.000.
Trieb, Herbert, to Konrad Doppelmayr & Sohn Maschinenfabrik mbH & Co. KG. Conveyor system for transporting goods. 6,039,171, Cl. 198-699.000.
Tripep AB: *See*—
Sällberg, Matti, 6,040,137, Cl. 435-5.000.
Trisol Inc.: *See*—
Mesher, Shaun T. E., 6,039,865, Cl. 208-263.000.
Trissel, David Wesley, to Motorola, Inc. Computer instruction which generates multiple results of different data types to improve software emulation. 6,039,765, Cl. 703-26.000.
Tröger, Johannes: *See*—
Heisel, Uwe; and Tröger, Johannes, 6,039,096, Cl. 144-235.000.
Trokhan, Paul Dennis; Phan, Dean Van; Deason, Howard Thomas; and Kleinwächter, Jörg, to Procter & Gamble Company, The. Method for making paper structures having a decorative pattern. 6,039,839, Cl. 162-116.000.
Trombley, Michael C.: *See*—
Patmore, Kevin M.; Price, Jeffrey A.; and Trombley, Michael C., 6,039,105, Cl. 160-24.000.
Trustees of Princeton University, The: *See*—
Kahne, Daniel E.; and Yan, Lin, 6,040,433, Cl. 536-4.100.
Trutschel, Hartwig Horst: *See*—
Lehrieder, Erwin Paul Josef; Röder, Klaus Walter; and Trutschel, Hartwig Horst, 6,039,284, Cl. 242-559.000.
TRW Automotive Electronics & Components GmbH & Co. KG: *See*—
Kraus, Willibald, 6,039,523, Cl. 411-48.000.
TRW Inc.: *See*—
Cannon, William J.; Remnant, David K.; Ward, Paul D.; and Hoerig, Timothy R., 6,041,402, Cl. 712-200.000.
Hobaugh, James M., II; and Cartwright, Mark A., 6,038,941, Cl. 74-493.000.
Hsu, Shi-Ping; Ling, James M.; Messenger, Arthur F.; and Evans, Bruce W., 6,041,410, Cl. 713-186.000.
Mehney, Mark A.; McCarthy, Michael C.; Fullerton, Michael G.; and Malecke, Floyd J., 6,039,344, Cl. 280-735.000.
Munch, Carl A., 6,040,532, Cl. 177-144.000.
Urbach, Brian A., 6,039,337, Cl. 280-124.134.
Wedeen, Robert S.; Durham, Arthur J.; Ferris, Matthew D.; and Dow, G. Sam, 6,040,739, Cl. 330-66.000.
Wolfe, George B., 6,040,542, Cl. 200-512.000.
TRW Occupant Restraint Systems GmbH: *See*—
Fischer, Anton, 6,039,340, Cl. 280-728.200.
Wier, Franz, 6,039,352, Cl. 280-806.000.
TRW Occupant Restraitn Systems GmbH & Co. KG: *See*—
Heilig, Alexander; and Schultz, Dirk, 6,039,380, Cl. 296-70.000.
TRW Steering Systems Japan Ltd.: *See*—
Ozeki, Keita, 6,039,334, Cl. 280-93.514.
TRW Vehicle Safety Systems Inc.: *See*—
Bauer, Barney J.; and Herberg, Arnold J., 6,039,353, Cl. 280-806.000.
Scherer, David F., 6,039,343, Cl. 280-731.000.
Tsai, Chia-Shiung: *See*—
Chen, Chao-Cheng; Huang, Ming-Hsin; Tao, Hun-Jan; and Tsai, Chia-Shiung, 6,040,248, Cl. 438-725.000.
Tsai, Ching Cheng; and Chou, Wen To, to Chicony Electronics Co., Ltd. Keyswitch structure. 6,040,540, Cl. 200-344.000.
Tsai, Li C.; and Blumberg, Richard M., to Hewlett-Packard Company. Digital circuit to count like signals in a data word. 6,041,092, Cl. 377-1.000.
Tsangaris, Paris: *See*—
Kirchhoefer, Dennis Ray; Miller, Thomas Edward; and Tsangaris, Paris, 6,041,131, Cl. 381-415.000.
Tse, Bruno: *See*—
Balkovec, James M.; and Tse, Bruno, 6,040,463, Cl. 549-418.000.
Tseng, Gwou-Jong; and Kang, Yuh-Huey, to Hon Hai Precison Ind. Co., Ltd. Electrical connector. 6,039,595, Cl. 439-377.000.
Tseng, Horng-Huei: *See*—
Chiou, Chie-Wun; and Tseng, Horng-Huei, 6,039,526, Cl. 414-411.000.
Tsenter, Boris; and Golod, Mikhail, to Total Battery Management, Inc. Energy transfer and equalization in rechargeable lithium batteries. 6,040,685, Cl. 320-160.000.
Tsou, Andy H.: *See*—
Chen, Jiann H.; Lancaster, Robert A.; Tsou, Andy H.; and Anderson, Charles C., 6,041,210, Cl. 399-333.000.
Tsu, Wilson: *See*—
McMullen, Jacques; Tsu, Wilson; and Kargel, Reinhard, 6,039,789, Cl. 75-711.000.
Tsuboi, Takayuki; Yagyu, Mineto; Nagano, Akihiko; and Kikuchi, Hiroshi, to Canon Kabushiki Kaisha. Display device. 6,040,880, Cl. 349-5.000.
Tsuboi, Takayuki: *See*—
Kikuchi, Hiroshi; and Tsuboi, Takayuki, 6,041,190, Cl. 396-284.000.
Tsubokawa, Masahiro: *See*—
Takeuchi, Yoshiharu; Aburaya, Kiyoji; Yasu, Toshiharu; Tsubokawa, Masahiro; Sakai, Manabu; Aoshika, Shoji; and Narita, Tsutayoshi, 6,039,551, Cl. 418-88.000.
Tsubouchi, Nobuteru: *See*—
Chayahara, Akiyoshi; Horino, Yuji; Kinomura, Atsushi; Tsubouchi, Nobuteru; and Fujii, Kanenaga, 6,039,847, Cl. 204-192.110.
Tsuchiya, Tomohiro, to NEC Corporation. Semiconductor memory device. 6,041,006, Cl. 365-210.000.
Tsuchiya, Yoshimi; Nomoto, Takashi; Ohsawa, Hirokazu; Kawakami, Kumiko; Ohwaki, Kenji; and Nishikibe, Masaru, to Banyu Pharmaceutical Co Ltd. Fluorine-containing 1, 4-disubstituted piperidine derivatives. 6,040,449, Cl. 546-193.000.
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Makino, Masanori; Mochizuki, Hirotake; Misawa, Takao; and Tsuda, Takao, 6,040,891, Cl. 355-46.000.
Tsuji, Tomoko; Takai, Hisashi; and Goda, Hiroki, to Uni-Charm Corporation. Liquid-permeable topsheet for body exudates absorbent article, apparatus and method for manufacturing same. 6,039,555, Cl. 425-362.000.
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Tsukamoto, Hironori, to Sony Corporation. Method of manufacturing semiconductor devices. 6,040,224, Cl. 438-308.000.
Tsukamoto, Junichi: *See*—
Izumi, Nobuaki; Fukushima, Shinichi; and Tsukamoto, Junichi, 6,040,873, Cl. 348-559.000.
Tsukerman, Alex, to Oracle Corporation. Method and apparatus for using undo/redo logging to perform asynchronous updates of parity and data pages in a redundant array data storage environment. 6,041,423, Cl. 714-19.000.
Tsukuda, Yoshihiro: *See*—
Yamada, Kazuo; Mitate, Takehito; Nishimura, Naoto; Tsukuda, Yoshihiro; and Minato, Kazuaki, 6,040,092, Cl. 429-331.000.
Tsumiyama, Tatsuo: *See*—
Yamamoto, Tomohiko; Tsumiyama, Tatsuo; and Sugimoto, Kouji, 6,040,418, Cl. 528-353.000.
Tsumura, Makoto: *See*—
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Tsuneji, Anjai: *See*—
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Tsutsui, Toshiyuki: *See*—
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Tsutsumi, Kojiro: *See*—
Isobe, Takashi; and Tsutsumi, Kojiro, 6,038,912, Cl. 73-1.590.
Tsuura, Katsuhiko, to Matsushita Electronics Corporation. Contactor and semiconductor device inspecting method. 6,040,706, Cl. 324-765.000.
Tsuzuki, Koichi: *See*—
Tanaka, Tetsuya; Tsuzuki, Koichi; Nishijima, Noriyo; Handa, Fumitaka; and Nakadaira, Shiro, 6,039,866, Cl. 210-136.000.
Tu, Mai Xuan; Schwab, Michel; and Musy, Jean-Pierre, to Patek Philippe S.A. Mechanical-electric energy converter and watch part comprising this energy converter. 6,041,022, Cl. 368-64.000.
Tubbs, Michael E.: *See*—
Ramsey, Jens K.; Stevens, Jeffrey C.; Tubbs, Michael E.; and Stancil, Charles J., 6,041,401, Cl. 712-43.000.
Tucker, Sean W.; Cowan, Michael R.; and Martin, Mark P., to Hewlett-Packard Company. Mechanism for removal of surface mount connectors using heat conduction through pins. 6,039,241, Cl. 228-264.000.
Tufano, Anthony: *See*—
Getselis, Arkady; Newman, Walter; and Tufano, Anthony, 6,039,597, Cl. 439-441.000.
Tufts University: *See*—
Huber, Brigitte T.; Schmitz, Tracy; and Underwood, Robert, 6,040,145, Cl. 435-7.200.
Tully, Robert Edward: *See*—
Skrabanja, Arnold Titus Philip; and Tully, Robert Edward, 6,040,301, Cl. 514-214.000.
Tuncer, Haluk: *See*—
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Tung, Shih-Hsiung Steve: *See*—

Liu, Peichun Peter; Singh, Rajinder Paul; and Tung, Shih-Hsiung Steve, 6,041,390, Cl. 711-110.000.
Tunnel Radio of America, Inc.: *See—*
Rose, Mark D.; and Haining, Robert W., 6,041,216, Cl. 455-9.000.
Tuno, Yoshihide: *See—*
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Tuominen, Marko: *See—*
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Turcotte, Yvon; and Coulombe, Alain, to Turcotte, Yvon. Combined air exchange and air conditioning unit. 6,038,879, Cl. 62-325.000.
Turecek, Peter; Schwarz, Hans-Peter; and Eibl, Johann, to Baxter Aktiengesellschaft. Pharmaceutical preparation for treating blood coagulation disorders. 6,039,945, Cl. 424-94.640.
Turek, David G.: *See—*
Anderson, David K.; Chiu, John H.; McNary, Steven F.; Phyfe, Nicole M.; Turek, David G.; and Mylchreest, Donald G., 6,039,008, Cl. 122-510.000.
Turkiye Sise ve cam Fabrikalari A.S.: *See—*
Demiryont, Hüyla; Parlar, Hüseyin; Ersoy, Ayse; and Aktulga, Ender, 6,040,939, Cl. 359-360.000.
Turner, Clive Nathan, to Nokia Mobile Phones, Ltd. Transferring information. 6,041,229, Cl. 455-420.000.
Turner, Tom; and Livergood, Robert J., to Holmes Product Corp. Lamp with safety features. 6,039,462, Cl. 362-410.000.
Turnsek, Jürgen Peter: *See—*
Hegner, Frank; Schmidt, Elke Maria; Güther, Volker; Otto, Andreas; Breme, Jürgen; Müller, Heinz; and Turnsek, Jürgen Peter, 6,039,918, Cl. 420-422.000.
Turovets, Igor: *See—*
Lewis, Aaron; Palanker, Daniel; and Turovets, Igor, 6,039,726, Cl. 606-3.000.
Turrentine, Mary Faye. Cosmetic applicator. 6,039,053, Cl. 132-320.000.
Tuunanen, Jukka, to Labsystems Oy. Method and means for magnetic particle specific binding assay. 6,040,192, Cl. 436-177.000.
Twentieth Century Fox Film Corporation: *See—*
Kelley, David E.; Kramer, Jeffrey C.; Pontell, Jonathan L.; Parral, Loretta S.; Roth, Michelle V.; Yergen, Anoush; and Sanford, Arlene, 6,039,710, Cl. 602-74.000.
Tyrrell, Steven P., to Biosafe Laboratories, Inc. Method for correcting for blood volume in a serum analyte determination. 6,040,135, Cl. 435-4.000.
Ube Industries, Ltd.: *See—*
Yamamoto, Tomohiko; Tsumiyama, Tatsuo; and Sugimoto, Kouji, 6,040,418, Cl. 528-353.000.
Uchida, Jun, to NEC Corporation. Direct conversion receiver using single reference clock signal. 6,040,738, Cl. 329-302.000.
Uchihashi Estec Co., Ltd.: *See—*
Kawanishi, Toshiro, 6,040,754, Cl. 337-297.000.
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Yamashita, Rikiya, to Dai Nippon Printing Co., Ltd. Cover tape. 6,040,047, Cl. 428-343.000.

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Ziegler, Douglas D.: *See*—
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Ziegler, Paula J.: *See*—
Bangs, William E.; Dibenedetto, Joseph D.; Friedberg, Joyce L.; Giordano, Denise A.; Glover, Judy M.; Khoo, Chor San Heng; Ko, Sandy; MacNair, R. David C.; Noar, Scott R.; Randazzi, John J., Jr.; Stoever, Harro; and Ziegler, Paula J., 6,039,989, Cl. 426-106.000.

Ziegler, Raymond J.: *See*—
Debe, Mark K.; Haugen, Gregory M.; Steinbach, Andrew J.; Thomas, John H., III; and Ziegler, Raymond J., 6,040,077, Cl. 429-40.000.

Zielinski, Michael, to Rotor Clamp, Inc. Hose clamp. 6,038,744, Cl. 24-20.00R.

Zika, Steven J.; and Hopper, C. Bradford, to Advanced Micro Devices, Inc. Method and apparatus for detecting process sensitivity to integrated circuit layout using wafer to wafer defect inspection device. 6,040,912, Cl. 356-394.000.

Zimerla, Edward L.: *See*—
Piperato, Michael C.; and Zimerla, Edward L., 6,039,049, Cl. 128-898.000.

Zimmerle, William J.: *See*—
Fox, Richard H.; Steinbacher, David M.; Olin, Wesley L.; Meyers, Vernon O.; and Zimmerle, William J., 6,039,158, Cl. 188-162.000.

Zimmerman, Julie G.; and Jacobsen, Alex W., to Kallman Corporation. Storage page for three-dimensional items. 6,039,495, Cl. 402-79.000.

Zimmerman, Roger A. Unused hanger indicator system and method therefor. 6,039,225, Cl. 223-85.000.

Zimmermann, Andreas: *See*—
Behme, Klaus-Jürgen; Jansen, Rolf-Michael; and Zimmermann, Andreas, 6,040,375, Cl. 524-492.000.

Zimmermann, Wilhelm: *See*—
Stein, Bernd; Lehnert, Heinz; Zimmermann, Wilhelm; and Steinhauer, Heinz, 6,038,901, Cl. 72-85.000.

Zink, Joe M. Portable sheet metal brake. 6,038,909, Cl. 72-319.000.
Zinoviev, Nikolai Timofeevich; and Siomkin, Boris Vasilievich, to Itac, Ltd. Method and apparatus for crushing nonconductive materials. 6,039,274, Cl. 241-1.000.
Zinser Textilmaschinen GmbH: *See—*
Machnik, Franz; and Weeger, Hans-Peter, 6,038,845, Cl. 57-267.000.
Mack, Karl-Heinz, 6,038,846, Cl. 57-281.000.
Zola, Philip J.: *See—*
Boettcher, John W.; Jagannathan, Seshadri; Orem, Michael W.; and Zola, Philip J., 6,040,128, Cl. 430-569.000.
Zollitsch, Ludwig; and Kreuz, Ulrich, to C.F.Scheer & Cie GmbH & Co. Apparatus and method for granulating plastic strands. 6,039,905, Cl. 264-143.000.
Zubin, Claudio: *See—*
Witkowski, Ireneusz; and Zubin, Claudio, 6,039,602, Cl. 439-550.000.
Zulu, Joshua. Steering control system for an articulating work machine having a steering fluid cylinder and a fluid-powered differential. 6,039,133, Cl. 180-6.640.
Zunquan, Liu. Device and method for data integrity and authentication. 6,041,409, Cl. 713-176.000.
Zuppa, Riccardo, to Palazzoli S.p.A. Body for electrical outlet or plug. 6,039,594, Cl. 439-318.000.
ZymoGenetics, Inc.: *See—*
Berkner, Kathleen L.; Petersen, Lars Christian; Hart, Charles E.; Hedner, Ulla; and Bregengaard, Claus, 6,039,944, Cl. 424-94.640.
314613 B.C. Ltd.: *See—*
Beder, Douglas S., 6,041,262, Cl. 607-139.000.
3Com Corporation: *See—*
Flanders, John A.; Ready, David C.; Van Seters, Steven; Schwartz, Leonard; and Townsend, William D., 6,041,058, Cl. 370-401.000.
Hart, John H.; and Sherer, W. Paul, 6,041,166, Cl. 395-200.680.
3M Innovative Properties Company: *See—*
Bland, Ralph H.; Jonza, James M.; Smith, James D.; Bradley, Jeffrey F.; and Smith, Kenneth B., 6,040,061, Cl. 428-480.000.
Debe, Mark K.; Haugen, Gregory M.; Steinbach, Andrew J.; Thomas, John H., III; and Ziegler, Raymond J., 6,040,077, Cl. 429-40.000.
Govind, Nayna; Jinks, Philip A.; Ross, Danna L.; and Ward, Gary H., 6,039,932, Cl. 424-45.000.
Ho, Kwok-Lun; Follensbee, Robert A.; Harmer, Walter L.; and Morris, Mary L., 6,039,775, Cl. 51-295.000.
Le Riche, Frédéric Pierre Alain; and Pierre, Bernard Raymond, 6,040,006, Cl. 427-209.000.
Lundin, David J.; and Eliason, Kevin M., 6,039,553, Cl. 425-115.000.
Matsumoto, Kenji; Suzuki, Kazuo; and Haga, Muneo, 6,040,004, Cl. 427-185.000.
Miller, Philip; and LaLiberte, Thomas R., 6,039,911, Cl. 264-280.000.
Sadrakula, Philip V.; Kampa, Leonard; Hamerski, Michael D.; and Bries, James L., 6,039,102, Cl. 156-510.000.
Tomai, Mark A.; Hammerbeck, David M.; and Swingle, Karl F., 6,039,969, Cl. 424-434.000.
Wright, Robin E., 6,040,352, Cl. 522-2.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21st DAY OF MARCH, 2000

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adamik, John A.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Andoh, Hisashi: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Applied Materials, Inc.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Clinical Dynamics Corporation: *See—*
Costello, Leo F., Jr., RE. 36,620, Cl. 250-252.100.

Collins, Kenneth S.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Costello, Leo F., Jr., to Clinical Dynamics Corporation. Pulse oximetry testing. RE. 36,620, Cl. 250-252.100.

Eastlex Machine Corporation: *See—*
Schmidt, Volker; and Schmidt, Erich A., RE. 36,619, Cl. 227-119.000.

Harker, Brian G., to Hilti Aktiengesellschaft. Drywall fastener. RE. 36,622, Cl. 411-21.000.

Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, to Rolic AG. Linear and cyclic polymers or oligomers having a photoreactive ethene group. RE. 36,625, Cl. 526-245.000.

Hilti Aktiengesellschaft: *See—*
Harker, Brian G., RE. 36,622, Cl. 411-21.000.

Hitachi, Ltd.: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Ikuta, Isao: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Katoh, Yoshimi: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Kelly, Stephen: *See—*
Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, RE. 36,625, Cl. 526-245.000.

Law, Kam S.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Leung, Cissy: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, to Hitachi, Ltd. Optical recording media and information recording and reproducing units. RE. 36,624, Cl. 430-270.130.

Maydan, Dan: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Minemura, Hiroyuki: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Nagai, Masaichi: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Nakaoka, Yuji, to NEC Corporation. Semiconductor memory device. RE. 36,621, Cl. 365-189.010.

NEC Corporation: *See—*
Nakaoka, Yuji, RE. 36,621, Cl. 365-189.010.

Perlov, Ilya: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Rolic AG: *See—*
Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, RE. 36,625, Cl. 526-245.000.

Sato, Yoshio: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Schadt, Martin: *See—*
Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, RE. 36,625, Cl. 526-245.000.

Schmidt, Erich A.: *See—*
Schmidt, Volker; and Schmidt, Erich A., RE. 36,619, Cl. 227-119.000.

Schmidt, Volker; and Schmidt, Erich A., to Eastlex Machine Corporation. Rotary hopper for an attaching apparatus. RE. 36,619, Cl. 227-119.000.

Schmitt, Klauss: *See—*
Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, RE. 36,625, Cl. 526-245.000.

Schuster, Andreas: *See—*
Herr, Rolf-Peter; Kelly, Stephen; Schadt, Martin; Schmitt, Klauss; and Schuster, Andreas, RE. 36,625, Cl. 526-245.000.

Tsuboi, Nobuyoshi: *See—*
Maeda, Yoshihito; Ikuta, Isao; Andoh, Hisashi; Nagai, Masaichi; Katoh, Yoshimi; Sato, Yoshio; Tsuboi, Nobuyoshi; and Minemura, Hiroyuki, RE. 36,624, Cl. 430-270.130.

Umotoy, Salvador P.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, to Applied Materials, Inc. Process for PECVD of silicon oxide using TEOS decomposition. RE. 36,623, Cl. 427-579.000.

White, John M.: *See—*
Wang, David Nin-Kou; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, RE. 36,623, Cl. 427-579.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ball, Hershell R., Jr.: *See—*
Swartzel, Kenneth R.; Ball, Hershell R., Jr.; and Hamid-Samimi, Mohammad-Hossein, B1 994,291, Cl. 426-399.000.

Barron, Charles Dwain: *See—*
Dailey, Patrick E.; and Barron, Charles Dwain, B1 646,611, Cl. 340-853.600.

Cal-West Equipment Company, Inc.: *See—*
Woodhall, Edward W.; and Kondrats, Nicholas, B1 411,760, Cl. 427-156.000.

Dailey, Patrick E.; and Barron, Charles Dwain, to Halliburton Energy Services, Inc. System and method for indirectly determining inclination at the bit. B1 646,611, Cl. 340-853.600.

Geneva Manufacturing Co.: *See—*
Lance, Sandra L.; and Lance, Marshall R., B1 743,584, Cl. 296-37.600.

Halliburton Energy Services, Inc.: *See—*
Dailey, Patrick E.; and Barron, Charles Dwain, B1 646,611, Cl. 340-853.600.

Hamid-Samimi, Mohammad-Hossein: *See—*
Swartzel, Kenneth R.; Ball, Hershell R., Jr.; and Hamid-Samimi, Mohammad-Hossein, B1 994,291, Cl. 426-399.000.

Kondrats, Nicholas: *See—*
Woodhall, Edward W.; and Kondrats, Nicholas, B1 411,760, Cl. 427-156.000.

Lance, Marshall R.: *See—*
Lance, Sandra L.; and Lance, Marshall R., B1 743,584, Cl. 296-37.600.

Lance, Sandra L.; and Lance, Marshall R., to Geneva Manufacturing Co. Vehicle mounted storage unit. B1 743,584, Cl. 296-37.600.

North Carolina State University: *See—*
Swartzel, Kenneth R.; Ball, Hershell R., Jr.; and Hamid-Samimi, Mohammad-Hossein, B1 994,291, Cl. 426-399.000.

Swartzel, Kenneth R.; Ball, Hershell R., Jr.; and Hamid-Samimi, Mohammad-Hossein, to North Carolina State University. Method for the ultrapasteurization of liquid whole egg. B1 994,291, Cl. 426-399.000.

Woodhall, Edward W.; and Kondrats, Nicholas, to Cal-West Equipment Company, Inc. Protective coating and method of such protective coating. B1 411,760, Cl. 427-156.000.

LIST OF DESIGN PATENTEES

Adams, Carl H.: *See*—
Kitabayashi, Joey; Lewis, Robert A.; Markowich, Michael; and Adams, Carl H., 421,694, Cl. D7-346.000.

American Standard Company: *See*—
Florian, Sean E., 421,699, Cl. D8-4.000.

American Standard Inc.: *See*—
Delker, Wilfried; and Schmitz, Walter, 421,789, Cl. D23-255.000.
Svendsen, Sean W., 421,793, Cl. D23-277.000.

Amway Corporation: *See*—
Heeter, Kristina B.; and DeBaschmakoff, Thierry Francois, 421,819, Cl. D28-85.000.

Armament Systems and Procedures, Inc.: *See*—
Parsons, Kevin L., 421,813, Cl. D26-46.000.

Armstrong, Donald M. Portable travel toothbrush. 421,679, Cl. D4-108.000.

Arnette, Kip, to Luxottica Leasing S.p.A. Eyewear front. 421,764, Cl. D16-326.000.

Arthur, Rodney Ivan, to Rope & Plastic Products Pty Ltd. Battery lift handle. 421,739, Cl. D13-119.000.

Avenatti, Giovanni, to Stilolinea S.r.l. Writing instrument. 421,771, Cl. D19-48.000.

Aztec Concrete Accessories, Inc.: *See*—
Haslem, Dale; Hartzheim, G. Douglas; Wilbur, Steve; and Lancial, Marty, 421,709, Cl. D8-354.000.

Baldwin Hardware Corporation: *See*—
Meck, Leslie A.; and Roberts, Rockwood T., III, 421,814, Cl. D26-67.000.

Barnaville, James: *See*—
Pickering, Colin; and Barnaville, James, 421,763, Cl. D16-326.000.

BBC International, Ltd.: *See*—
Debiase, Max; and Wilborn, Donald R., 421,676, Cl. D2-897.000.

Bergstrom, Kurt Jon: *See*—
Fierro, Anthony John; Bergstrom, Kurt Jon; Legge, Kevin Christopher; Griffin, David Allen; and Sevart, Jeffrey Leon, 421,732, Cl. D12-146.000.

Bevacco, Marc P., to Cherne Industries Incorporated. Two piece mechanical plug assembly. 421,792, Cl. D23-260.000.

Biermann, Gunter: *See*—
Graf, Torsten; Graf, Andrea; and Biermann, Gunter, 421,806, Cl. D25-113.000.

Bignon, Lucas: *See*—
Lion, Mathieu; and Bignon, Lucas, 421,706, Cl. D8-91.000.

Blair, Dwight Nelson; and Pangburn, Thomas Eugene, to Lexmark International, Inc. Printer. 421,768, Cl. D18-50.000.

Blenke, Timothy James: *See*—
Van Gompel, Paul Theodore; Roessler, Thomas Harold; Suprise, Jody Dorothy; Vogt, Robert Eugene; and Blenke, Timothy James, 421,802, Cl. D24-126.000.

Bodker, Alan N.: *See*—
Durliat, Leonaora M.; and Bodker, Alan N., 421,718, Cl. D9-434.000.

Bogard, Donald E. Pick-up truck lightweight cargo cover. 421,736, Cl. D12-401.000.

Bokros, Les: *See*—
Maayeh, George; Maayeh, Elias S.; and Bokros, Les, 421,759, Cl. D15-150.000.

Bonzer, Robert L. Hand-grip cordless inflator. 421,756, Cl. D15-7.000.

Borg, Chris Alan. Word formation game. 421,776, Cl. D21-336.000.

Bracken, Allen T.: *See*—
Sumner, Wayne A.; Griffith, David W.; Bracken, Allen T.; Brawne, Nicholas; and Nguyen, T. Greg, 421,748, Cl. D14-114.000.

Brandt, Charles M.: *See*—
Eberle, Theodore F.; Cheng, Jizu J.; Kraft, Richard G.; and Brandt, Charles M., 421,720, Cl. D9-500.000.

Brawne, Nicholas: *See*—
Sumner, Wayne A.; Griffith, David W.; Bracken, Allen T.; Brawne, Nicholas; and Nguyen, T. Greg, 421,748, Cl. D14-114.000.

Breen, John D., to Rubbermaid Incorporated. Broom shroud. 421,681, Cl. D4-199.000.

Bridgestone/Firestone, Research, Inc.: *See*—
Guspodin, James G.; Wright, Richard J.; and Regallis, John J., 421,733, Cl. D12-147.000.

Brostrom, Gerald M.; and Byram, David C., to 3M Innovative Properties Company. Carriage for drop-down mask assembly. 421,801, Cl. D24-110.100.

Brown, John P.; and Brown, Susan E. Ornamental hook. 421,712, Cl. D8-370.000.

Brown, Susan E.: *See*—
Brown, John P.; and Brown, Susan E., 421,712, Cl. D8-370.000.

Byram, David C.: *See*—
Brostrom, Gerald M.; and Byram, David C., 421,801, Cl. D24-110.100.

Canon Kabushiki Kaisha: *See*—
Kusanagi, Takashi, 421,767, Cl. D18-39.000.
Takizawa, Sakiko, 421,747, Cl. D14-113.000.

Canton Gongora, Antonio; Cruz Fernandez, Carlos Jesús; Muñagorri Enriquez, José Maria; and Rayo Ortigüela, Juan Carlos, to Telefonica de Espana, S.A. Modular lighting fixture. 421,816, Cl. D26-76.000.

Carbone, Richard J., to HP Intellectual Corp. Toaster. 421,693, Cl. D7-330.000.

Carrabba, Salvatore R. Storage cabinet. 421,685, Cl. D6-432.000.

Carroll, George H.: *See*—
Indelicato, Len; and Carroll, George H., 421,716, Cl. D9-318.000.

Casio Keisanki Kabushiki Kaisha: *See*—
Ono, Junichi, 421,744, Cl. D14-100.000.

Chan, Raymond, to IDT Communication Technology Ltd. Telephone. 421,751, Cl. D14-151.000.

Chaney, Michael T.; Hauberg, Jonathan C.; and Siudzinski, Paul A., to Dayton Technologies, Inc. Deck plank support extrusion. 421,808, Cl. D25-125.000.

Chang, Chih-Hung; and Wang, Wen-Tsung, to Largan Digital Co., Ltd. Camera. 421,761, Cl. D16-209.000.

Chang, Eddie, to Man Nin Shing Company Limited. Rocking clock. 421,722, Cl. D10-26.000.

Charles Worthington Hair Accessories Unlimited: *See*—
Worthington, John Charles, 421,680, Cl. D4-128.000.

Chen, Paul M.: *See*—
Doud, Galen C.; Sytsma, Cory J.; and Chen, Paul M., 421,688, Cl. D6-491.000.

Cheng, Jizu J.: *See*—
Eberle, Theodore F.; Cheng, Jizu J.; Kraft, Richard G.; and Brandt, Charles M., 421,720, Cl. D9-500.000.

Cherne Industries Incorporated: *See*—
Bevacco, Marc P., 421,792, Cl. D23-260.000.

Chodat, Jean-Pierre, to Ebel S.A. Watch case. 421,724, Cl. D10-30.000.

Chromcraft/Revington Company: *See*—
Saul, Gregory M., 421,684, Cl. D6-373.000.

Collmar, Ted P., to Great 2000 Enterprises, Inc. Combined ceiling fan and light fixture. 421,797, Cl. D23-377.000.

Craig, Margaret A.: *See*—
Shirley, Brian E.; Eichelberger, Brian T.; and Craig, Margaret A., 421,762, Cl. D16-227.000.

Crown Cork & Seal Technologies Corporation: *See*—
Eberle, Theodore F.; Cheng, Jizu J.; Kraft, Richard G.; and Brandt, Charles M., 421,720, Cl. D9-500.000.

Cruz Fernandez, Carlos Jesús: *See*—
Canton Gongora, Antonio; Cruz Fernandez, Carlos Jesús; Muñagorri Enriquez, José Maria; and Rayo Ortigüela, Juan Carlos, 421,816, Cl. D26-76.000.

Curci, James P. Display case. 421,687, Cl. D6-473.000.

DaimlerChrysler AG: *See*—
Sacco, Bruno; and Pfeiffer, Peter, 421,734, Cl. D12-163.000.

Dallman, Ernest R., to Dallman Industrial Corporation. Light fixture for an ATM kiosk or surround. 421,826, Cl. D99-43.000.

Dallman Industrial Corporation: *See*—
Dallman, Ernest R., 421,826, Cl. D99-43.000.

Davis, Charles P.: *See*—
Neyer, James U.; Petterson, Tor H.; Pavlakovich, Zoltan; Huber, Bret T.; and Davis, Charles P., 421,812, Cl. D26-45.000.

Dayton Technologies, Inc.: *See*—
Chaney, Michael T.; Hauberg, Jonathan C.; and Siudzinski, Paul A., 421,808, Cl. D25-125.000.

DBW Marketing, Inc.: *See*—
Willardson, Donald J., 421,683, Cl. D6-328.000.

DeBaschmakoff, Thierry Francois: *See*—
Heeter, Kristina B.; and DeBaschmakoff, Thierry Francois, 421,819, Cl. D28-85.000.

Debiase, Max; and Wilborn, Donald R., to BBC International, Ltd. Interlocking sandal. 421,676, Cl. D2-897.000.

De Jong, Marcel: *See*—
French, John T.; Smith, Raymond G.; and De Jong, Marcel, 421,795, Cl. D23-350.000.

Delker, Wilfried; and Schmitz, Walter, to American Standard Inc. Spout. 421,789, Cl. D23-255.000.

Devant, Ltd.: *See*—
Whitesides, David M., 421,780, Cl. D21-754.000.

Deyoe, Eric A. Head for stringed instruments. 421,766, Cl. D17-20.000.

Dialight Corporation: *See*—
Yang, Yubo; You, Chenhua; and Eikelberger, Rand J., 421,726, Cl. D10-111.000.

Distinctive Applicances, Inc.: *See*—
Kitabayashi, Joey; Lewis, Robert A.; Markowich, Michael; and Adams, Carl H., 421,694, Cl. D7-346.000.

Doat, Arnaud, to Pierre Fabre Medicament. Powder and compressed-air inhaler. 421,800, Cl. D24-110.000.

Dong, Sheng: *See*—
Saxena, Parichay; Dong, Sheng; and Nsonwu, Alexandra, 421,749, Cl. D14-114.700.

Doud, Galen C.; Sytsma, Cory J.; and Chen, Paul M., to HON Technology Inc. Metal furniture tubing. 421,688, Cl. D6-491.000.

Dow, James C.: *See*—
Khovaylo, Modest; and Dow, James C., 421,746, Cl. D14-107.000.

Dubson, Paul T., to Hewlett-Packard Company. Printer control device. 421,769, Cl. D18-56.000.

Durliat, Leonaora M.; and Bodker, Alan N., to Owens-Illinois Closure Inc. Portion of a trigger for trigger pump dispenser. 421,718, Cl. D9-434.000.

E & B Giftware, Inc.: *See*—
Hollinger, Fred, 421,697, Cl. D7-624.000.
Hollinger, Fred, 421,701, Cl. D8-42.000.

Ebel S.A.: *See*—
Chodat, Jean-Pierre, 421,724, Cl. D10-30.000.

Eberle, Theodore F.; Cheng, Jizu J.; Kraft, Richard G.; and Brandt, Charles M., to Crown Cork & Seal Technologies Corporation. Container. 421,720, Cl. D9-500.000.

Eichelberger, Brian T.: *See*—
Shirley, Brian E.; Eichelberger, Brian T.; and Craig, Margaret A., 421,762, Cl. D16-227.000.

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CLASSIFICATION OF PATENTS

ISSUED MARCH 21, 2000

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346 6,038,988

CLASS 111

123 6,038,989
124 6,038,990

CLASS 114

131 6,038,991
183 R 6,038,992
255 6,038,993
259 6,038,994
271 6,038,995
297 6,038,996

CLASS 116

308 6,038,997

CLASS 117

20 6,039,801
49 6,039,802
89 6,039,803
206 6,039,804

CLASS 118

46 6,038,998
74 6,039,805
665 6,039,806
715 6,039,807
6,039,808
6,039,809
6,039,810
719 6,039,811
723 E 6,039,000
723 R 6,038,999
725 6,039,812

CLASS 119

14.47 6,039,001
57.1 6,039,002
166 6,039,003
172 6,039,004
249 6,039,005
315 6,039,006

CLASS 122

26 6,039,007
510 6,039,008

CLASS 123

2 6,039,009
41 E 6,039,010
51 AA 6,039,011
65 PE 6,039,012
6,039,013
90.11 6,039,014
90.17 6,039,015
6,039,016
90.43 6,039,017
90.55 6,039,018
90.61 6,039,019
196 R 6,039,020
306 6,039,021
321 6,039,022
339.23 6,039,023
396 6,039,024
399 6,039,025
6,039,026
6,039,027
436 6,039,028
442 6,039,029
457 6,039,030
470 6,039,031
520 6,039,032
568.17 6,039,033
568.23 6,039,034

CLASS 124

25.6 6,039,035
44.5 6,039,036

CLASS 125

13.01 6,039,037
39 6,039,038

CLASS 126

25 R 6,039,039
39 G 6,039,040
85 B 6,039,041

CLASS 127

42 6,039,813

CLASS 128

200.23 6,039,042
202.14 6,039,043
205.25 6,039,044
207.11 6,039,045
859 6,039,046
897 6,039,047
898 6,039,048
6,039,049

CLASS 132

309 6,039,050
313 6,039,051
6,039,052
320 6,039,053
321 6,039,054

CLASS 134

1 6,039,814
1.3 6,039,055
2 6,039,815
19 6,039,816
21 6,039,817
22.18 6,039,056
95.2 6,039,057
104.1 6,039,058
105 6,039,059
167 R 6,039,060

CLASS 135

16 6,039,061
6,039,062
33.7 6,039,063
66 6,039,064

CLASS 136

201 6,040,518
230 6,040,519
245 6,040,520
265 6,040,521

CLASS 137

3 6,039,065
312 6,039,066
337 6,039,067
377 6,039,068
454.2 6,039,069
491 6,039,070
505.37 6,039,071
512.3 6,039,072
515.7 6,039,073
537 6,039,074
625.28 6,039,075
625.37 6,039,076
625.63 6,039,077

CLASS 138

30 6,039,078
98 6,039,079
115 6,039,080
120 6,039,081
121 6,039,082
135 6,039,083
137 6,039,084
6,039,085

CLASS 139

54 6,039,086
192 6,039,087
6,039,088

CLASS 140

93.2 6,039,089

CLASS 141

17 6,039,090
83 6,039,091
129 6,039,092
386 6,039,093

CLASS 144

4 6,039,094
144.52 6,039,095
235 6,039,096
357 6,039,097
6,039,098

CLASS 148

307 6,039,818

CLASS 149

19.2 6,039,819
45 6,039,820

CLASS 152

158 6,039,099
243 6,039,100

CLASS 156

62.2 6,039,821
82 6,039,822
89.26 6,039,823
94 6,039,824
111 6,039,825
117 6,039,826
173 6,039,827
217 6,039,828
251 6,039,829
267 6,039,830
272.6 6,039,831
292 6,039,832
344 6,039,833
345 6,039,834
6,039,835
6,039,836
443 6,039,101
510 6,039,102
511 6,039,103

CLASS 157

21 6,039,104

CLASS 160

24 6,039,105
201 6,039,106
370.22 6,039,107

CLASS 162

29 6,039,837
109 6,039,838
116 6,039,839
205 6,039,840
251 6,039,841
272 6,039,842
352 6,039,843

CLASS 164

72 6,039,108

CLASS 165

8 6,039,109
10 6,039,110
104.14 6,039,111
109.1 6,039,112
159 6,039,113
170 6,039,114

CLASS 166

68.5 6,039,115
263 6,039,116
312 6,039,117
355 6,039,118
368 6,039,119
6,039,120
369 6,039,121
379 6,039,122

CLASS 169

45 6,039,123
61 6,039,124

CLASS 173

1 6,039,125
216 6,039,126

CLASS 174

7 6,040,522
35 R 6,040,523
36 6,040,524
40 CC 6,040,525
52.1 6,040,526
88 C 6,040,527
138 C 6,040,528
254 6,040,529
261 6,040,530

CLASS 175

57 6,039,127
70 6,039,128
258 6,039,129
320 6,039,130
376 6,039,131

CLASS 177

25.16 6,040,531
144 6,040,532

CLASS 180

6.44 6,039,132
6.64 6,039,133
14.1 6,039,134
65.3 6,039,135
182 6,039,136
220 6,039,137
245 6,039,138
271 6,039,139
287 6,039,140
329 6,039,141
333 6,039,142
412 6,039,143
446 6,039,144

CLASS 181

167 6,039,145
169 6,039,146

CLASS 182

15 6,039,147
16 6,039,148
20 6,039,149
113 6,039,150

CLASS 187

207 6,039,151
414 6,039,152

CLASS 188

24.22 6,039,153
67 6,039,154
73.39 6,039,155
73.44 6,039,156
158 6,039,157
162 6,039,158
322.15 6,039,159

CLASS 192

52.5 6,039,160
70.18 6,039,161
108 6,039,162
110 R 6,039,163

CLASS 194

206 6,039,164
217 6,039,165
317 6,039,166

CLASS 198

333 6,039,167
341.07 6,039,168
347.1 6,039,169
364 6,039,170
699 6,039,171
750.1 6,039,172

CLASS 200

5 A 6,040,533
6,040,534
43.08 6,040,535
83 N 6,040,536
86.5 6,040,537
293 6,040,538
302.1 6,040,539
344 6,040,540
6,040,541
512 6,040,542
559 6,040,543

CLASS 202

227 6,039,844

CLASS 203

57 6,039,845
6,039,846

CLASS 204

192.11 6,039,847
192.12 6,039,848
6,039,849
192.15 6,039,850
192.32 6,039,851
255 6,039,852
258 6,039,853
298.11 6,039,854
298.12 6,039,855
400 6,039,856

CLASS 205

106 6,039,857
136 6,039,858
159 6,039,859
208 6,039,860
335 6,039,861
386 6,039,862

CLASS 206

5 6,039,173
6 6,039,174
37 6,039,175
63.3 6,039,176
306 6,039,177
376 6,039,178
423 6,039,179
6,039,180
428 6,039,181
524.8 6,039,182
570 6,039,183
586 6,039,184
704 6,039,185
711 6,039,186
6,039,187
758 6,039,188

CLASS 208

113 6,039,863
134 6,039,864
263 6,039,865

CLASS 209

5 6,039,189
577 6,040,544

CLASS 210

136 6,039,866
173 6,039,867
232 6,039,868
6,039,869
321.61 6,039,870
321.71 6,039,871
500.35 6,039,872
605 6,039,873
6,039,874
606 6,039,875
635 6,039,876
636 6,039,877
640 6,039,878
641 6,039,879
708 6,039,880
732 6,039,881
747 6,039,882
748 6,039,883
760 6,039,884
767 6,039,885
776 6,039,886
800 6,039,887

CLASS 211

40 6,039,190
118 6,039,191
186 6,039,192

CLASS 212

270 6,039,193
301 6,039,194

CLASS 215

209 6,039,195
216 6,039,196
228 6,039,197
6,039,198
254 6,039,199

CLASS 216

13 6,039,888
17 6,039,889

CLASS 219

75 6,040,545
121.39 6,040,546
121.43 6,040,547
121.48 6,040,548
121.61 6,040,549
121.63 6,040,550
121.65 6,040,551
121.7 6,040,552
121.71 6,040,553
124.34 6,040,554
132 6,040,555
133 6,040,556
206 6,040,557
216 6,040,558
229 6,040,559
494 6,040,560
6,040,561
530 6,040,562
633 6,040,563
682 6,040,564
705 6,040,565

CLASS 220

263 6,039,200
484 6,039,201
533 6,039,202
562 6,039,203
623 6,039,204
659 6,039,205
737 6,039,206
739 6,039,207

CLASS 221

25 6,039,208
171 6,039,209

CLASS 222

1 6,039,210
6,039,211
30 6,039,212
39 6,039,213
93 6,039,214
137 6,039,215
6,039,216
146.5 6,039,217
153.06 6,039,218
160 6,039,219
236 6,039,220
361 6,039,221
386 6,039,222
389 6,039,223
565 6,039,224

CLASS 223

85 6,039,225

CLASS 224

42.24 6,039,226
521 6,039,227
532 6,039,228

CLASS 227

10 6,039,229
119 RE. 36,619
120 6,039,230
130 6,039,231
150 6,039,232
176.1 6,039,233

CLASS 228

4.5 6,039,234
44.5 6,039,235
46 6,039,236
51 6,039,237
110.1 6,039,238
157 6,039,239
219 6,039,240
264 6,039,241

CLASS 229

92.1 6,039,242
117.01 6,039,243

CLASS 235

375 6,039,244
379 6,039,245
6,039,246
6,039,247
6,039,248
6,039,249
380 6,039,250
6,039,251
462 6,039,252
462.01 6,039,253
462.32 6,039,254
462.35 6,039,255
462.43 6,039,256
468 6,039,257
472.01 6,039,258
475 6,039,259
492 6,039,260

CLASS 236

14 6,039,261
93 A 6,039,263
93 R 6,039,262

CLASS 237

12.3 R 6,039,264

CLASS 239

14.2 6,039,265
60 6,039,266
63 6,039,267
73 6,039,268
458 6,039,269
542 6,039,270
585.4 6,039,271
597 6,039,272
729 6,039,273

CLASS 241

1 6,039,274
17 6,039,275
30 6,039,276
189.1 6,039,277

CLASS 242

246 6,039,278
296 6,039,279
388.6 6,039,280
475.5 6,039,281
485.1 6,039,282
534 6,039,283
559 6,039,284
563 6,039,285
564.4 6,039,286

CLASS 244

54 6,039,287
118.1 6,039,288
165 6,039,290

CLASS 246

219 6,039,291

CLASS 248

118.5 6,039,292
125.8 6,039,293
188.4 6,039,294
262 6,039,295
311.2 6,039,296
314 6,039,297
545 6,039,298
562 6,039,299

CLASS 250

201.9 6,040,566
206 6,040,567
208.1 6,040,568
6,040,569
6,040,570
227.14 6,040,571
235 6,040,572
252.1 RE. 36,620
281 6,040,573
288 6,040,574
6,040,575
305 6,040,576
338.1 6,040,577
339.12 6,040,578
344 6,040,579
363.03 6,040,580
390.01 6,040,581
492.21 6,040,582
492.22 6,040,583
559.11 6,040,584
559.4 6,040,585
573 6,040,586

CLASS 251

129.12 6,039,300
144 6,039,301
149.1 6,039,302
149.6 6,039,303
209 6,039,304
342 6,039,305
353 6,039,306

CLASS 252

70 6,039,890
79.1 6,039,891
188.28 6,039,892
299.01 6,039,893
301.4 R 6,039,894
404 6,039,895
511 6,039,896

CLASS 256

19 6,039,307
65 6,039,308

CLASS 257

11 6,040,587
15 6,040,588
59 6,040,589
94 6,040,590
232 6,040,591
292 6,040,592
6,040,593
295 6,040,594
300 6,040,595
306 6,040,596
321 6,040,597
329 6,040,598
330 6,040,599
6,040,600
341 6,040,601
344 6,040,602
6,040,603
355 6,040,604
369 6,040,605
384 6,040,606
389 6,040,607
390 6,040,608
391 6,040,609
392 6,040,610
415 6,040,611
432 6,040,612
437 6,040,613
529 6,040,614
6,040,615
535 6,040,616
571 6,040,617
586 6,040,618
649 6,040,619
666 6,040,620
6,040,621
679 6,040,622
692 6,040,623
6,040,624
719 6,040,625
735 6,040,626
752 6,040,627
760 6,040,628
770 6,040,629
783 6,040,630
6,040,631
784 6,040,632
6,040,633

CLASS 261

1 6,039,309

CLASS 264

1.24 6,039,897
1.33 6,039,898
1.36 6,039,899
4.1 6,039,900
4.3 6,039,901
37.18 6,039,902
40.1 6,039,903
40.5 6,039,904
143 6,039,905
156 6,039,906
161 6,039,907
177.12 6,039,908
220 6,039,909
248 6,039,910
280 6,039,911
328.1 6,039,912
331.11 6,039,913
460 6,039,914

CLASS 266

49 6,039,915
82 6,039,916
217 6,039,917

CLASS 267

137 6,039,310
227 6,039,311

CLASS 269

47 6,039,312
168 6,039,313

CLASS 271

9.01 6,039,314
160 6,039,315
194 6,039,316
204 6,039,317

CLASS 273

153 S 6,039,318

CLASS 277

314 6,039,319
370 6,039,320
435 6,039,321
551 6,039,322
593 6,039,323
606 6,039,324
633 6,039,325

CLASS 280

5.506 6,039,326
7.021 6,039,327
7.13 6,039,328
11.19 6,039,329
11.2 6,039,330
14.2 6,039,331
47.17 6,039,332
47.18 6,039,333
93.514 6,039,334
124.103 6,039,335
124.128 6,039,336
124.134 6,039,337
288.4 6,039,338
507 6,039,339
728.2 6,039,340
6,039,341
728.3 6,039,342
731 6,039,343
735 6,039,344
6,039,345
736 6,039,346
6,039,347
741 6,039,348
748 6,039,349
775 6,039,350
781 6,039,351
806 6,039,352
6,039,353

CLASS 281

38 6,039,354

CLASS 283

2 6,039,355
61 6,039,356
93 6,039,357

CLASS 285

23 6,039,358
45 6,039,359
61 6,039,360
148.19 6,039,361

CLASS 290

45 6,040,634
52 6,040,635

CLASS 292

197 6,039,362
202 6,039,363
300 6,039,364
327 6,039,365
352 6,039,366

CLASS 293

117 6,039,367

CLASS 294

1.3 6,039,368
1.4 6,039,369
1.5 6,039,370
8.6 6,039,371
10 6,039,372
15 6,039,373
67.31 6,039,374
119.1 6,039,375
152 6,039,376

CLASS 296

24.1 6,039,377
37.16 6,039,378
37.6 6,039,379
B1 743,584
70 6,039,380
97.6 6,039,381
107.01 6,039,382
108 6,039,383
146.2 6,039,384
180.3 6,039,385
185 6,039,386
188 6,039,387
207 6,039,388
6,039,389
211 6,039,390
218 6,039,391

CLASS 297

172 6,039,392
184.13 6,039,393
195.1 6,039,394
202 6,039,395
214 6,039,396
289 6,039,397
354.1 6,039,398
362.12 6,039,399
367 6,039,400
378.13 6,039,401
411.34 6,039,402
440.24 6,039,403
452.64 6,039,404

CLASS 301

43 6,039,405
108.4 6,039,406
111 6,039,407
6,039,408

CLASS 303

7 6,039,409
6,039,410
116.1 6,039,411

CLASS 307

10.1 6,040,636
6,040,637
10.2 6,040,638
44 6,040,639
66 6,040,640
112 6,040,641

CLASS 310

12 6,040,642
26 6,040,643
43 6,040,644
58 6,040,645
71 6,040,646
89 6,040,647
90 6,040,648
91 6,040,649
268 6,040,650
313 B 6,040,651
320 6,040,652
328 6,040,653
366 6,040,654

CLASS 311

39.1 6,039,412

CLASS 312

9.15 6,039,413
205 6,039,414
229 6,039,415
245 6,039,416
257.1 6,039,417
258 6,039,418
262 6,039,419
265.1 6,039,420
333 6,039,421
334.1 6,039,422
334.29 6,039,423
405.1 6,039,424

CLASS 313

409 6,040,655
481 6,040,656
544 6,040,657
637 6,040,658

CLASS 315

56 6,040,659
200 A 6,040,660
224 6,040,661
291 6,040,662
6,040,663
383 6,040,664

CLASS 318

14 6,040,665
276 6,040,666
280 6,040,667
471 6,040,668
480 6,040,669
561 6,040,670
603 6,040,671
611 6,040,672
615 6,040,673
632 6,040,674
649 6,040,675
696 6,040,676
6,040,677
701 6,040,678
778 6,040,679

CLASS 320

108 6,040,680
113 6,040,681
136 6,040,682
137 6,040,683
139 6,040,684
160 6,040,685

CLASS 323

282 6,040,686
316 6,040,687
368 6,040,688

CLASS 324

127 6,040,689
142 6,040,690
158.1 6,040,691
173 6,040,692
210 6,040,693
230 6,040,694
240 6,040,695
303 6,040,696
318 6,040,697
399 6,040,698
754 6,040,699
6,040,700
6,040,701
755 6,040,702
6,040,703
762 6,040,704
6,040,705
765 6,040,706

CLASS 326

21 6,040,707
33 6,040,708
59 6,040,709
66 6,040,710
81 6,040,711
82 6,040,712
83 6,040,713
86 6,040,714
87 6,040,715
98 6,040,716
113 6,040,717

CLASS 327

71 6,040,718
78 6,040,719
83 6,040,720
110 6,040,721
143 6,040,722
144 6,040,723
170 6,040,724
175 6,040,725
6,040,726
277 6,040,727
292 6,040,728
309 6,040,729
344 6,040,730
359 6,040,731
408 6,040,732
525 6,040,733
530 6,040,734
541 6,040,735
6,040,736
543 6,040,737

CLASS 329

302 6,040,738

CLASS 330

66 6,040,739
149 6,040,740
297 6,040,741

CLASS 331

2 6,040,742
57 6,040,743
176 6,040,744

CLASS 333

26 6,040,745

CLASS 335

13 6,040,746
35 6,040,747
78 6,040,748
6,040,749
156 6,040,750
185 6,040,751
234 6,040,752

CLASS 336

223 6,040,753

CLASS 337

297 6,040,754

CLASS 338

22 R 6,040,755
160 6,040,756
6,040,757
197 6,040,758

CLASS 340

310.01 6,040,759
425.5 6,040,760
6,040,761
426 6,040,762
427 6,040,763
432 6,040,764
436 6,040,765
438 6,040,766
450.3 6,040,767
453 6,040,768
506 6,040,769
539 6,040,770
545 6,040,771
568.6 6,040,772
572.1 6,040,773
6,040,774
604 6,040,775
618 6,040,776
632 6,040,777
650 6,040,778
661 6,040,779
691.1 6,040,780
825.22 6,040,781
825.25 6,040,782
825.31 6,040,783
825.44 6,040,784
853.6 B1 646,611
928 6,040,785
6,040,786
932.2 6,040,787

CLASS 341

26 6,040,788
50 6,040,789
65 6,040,790
95 6,040,791
100 6,040,792
143 6,040,793
155 6,040,794

CLASS 342

70 6,040,795
6,040,796
159 6,040,797
357.01 6,040,798
357.06 6,040,799
387 6,040,800
457 6,040,801

CLASS 343

700 MS 6,040,802
6,040,803
702 6,040,804
785 6,040,805
853 6,040,806

CLASS 345

6 6,040,807
13 6,040,808
74 6,040,809
87 6,040,810
6,040,811
89 6,040,812
92 6,040,813
94 6,040,814
98 6,040,815
99 6,040,816
113 6,040,817
147 6,040,818
6,040,819
156 6,040,820
159 6,040,821
168 6,040,822
6,040,823
173 6,040,824
6,040,825
196 6,040,826
208 6,040,827
213 6,040,828
327 6,040,829
335 6,040,830
340 6,040,831
6,040,832
344 6,040,833
356 6,040,834
424 6,040,835
427 6,040,836
430 6,040,837
433 6,040,838
6,040,839
441 6,040,840
473 6,040,841
6,040,842
507 6,040,843
518 6,040,844
520 6,040,845
905 6,040,846

CLASS 347

15 6,039,425
19 6,039,426
6,039,427
6,039,428
6,039,429
6,039,430
30 6,039,431
32 6,039,432
40 6,039,433
43 6,039,434
55 6,039,435
62 6,039,436
63 6,039,437
6,039,438
6,039,439
65 6,039,440
70 6,039,441
86 6,039,442
89 6,039,443
92 6,039,444
105 6,039,445
151 6,040,847
159 6,040,848
214 6,040,849

CLASS 348

10 6,040,850
6,040,851
43 6,040,852
128 6,040,853
159 6,040,854
223 6,040,855
232 6,040,856
241 6,040,857
242 6,040,858
243 6,040,859
252 6,040,860
409 6,040,861
6,040,862
415 6,040,863
416 6,040,864
6,040,865
419 6,040,866
423 6,040,867
448 6,040,868
6,040,869
476 6,040,870
510 6,040,871
553 6,040,872
559 6,040,873
569 6,040,874
595 6,040,875
624 6,040,876
748 6,040,877
819 6,040,878
845.1 6,040,879

CLASS 349

5 6,040,880
8 6,040,881
39 6,040,882
116 6,040,883
129 6,040,884
6,040,885
141 6,040,886
6,040,887
155 6,040,888
174 6,040,889
182 6,040,890

CLASS 351

43 6,039,445
6,039,446
216 6,039,447

CLASS 355

46 6,040,891
53 6,040,892
6,040,893
6,040,894
70 6,040,895
72 6,040,896

CLASS 356

4.01 6,040,897
5.09 6,040,898
28.5 6,040,899
35.5 6,040,900
71 6,040,901
73 6,040,902
153 6,040,903
236 6,040,904
238.3 6,040,905
301 6,040,906
311 6,040,907
350 6,040,908
375 6,040,909
376 6,040,910
394 6,040,911
6,040,912
432 6,040,913
435 6,040,914
6,040,915
448 6,040,916

CLASS 358

1.17 6,040,917
296 6,040,918
400 6,040,919
403 6,040,920
434 6,040,921
468 6,040,922
498 6,040,923
523 6,040,924
525 6,040,925
6,040,926
534 6,040,927

CLASS 359

15 6,040,928
17 6,040,929
21 6,040,930
110 6,040,931
124 6,040,932
6,040,933
152 6,040,934
198 6,040,935
245 6,040,936
291 6,040,937
344 6,040,938
360 6,040,939
389 6,040,940
443 6,040,941
487 6,040,942
565 6,040,943
590 6,040,944
630 6,040,945
6,040,946
666 6,040,947
689 6,040,948
6,040,949
820 6,040,950
823 6,040,951
850 6,039,448
871 6,039,449
872 6,039,450

CLASS 360

48 6,040,952
53 6,040,953
68 6,040,954
75 6,040,955
92 6,040,956
98.08 6,040,957
103 6,040,958
6,040,959
105 6,040,960
113 6,040,961
6,040,962
118 6,040,963
121 6,040,964
122 6,040,965
132 6,040,966

CLASS 361

42 6,040,967
56 6,040,968
82 6,040,969
115 6,040,970
118 6,040,971
119 6,040,972
235 6,040,973
519 6,040,974
523 6,040,975
611 6,040,976
680 6,040,977
683 6,040,978
6,040,979
685 6,040,980
695 6,040,981
724 6,040,982
760 6,040,983
777 6,040,984
780 6,040,985

CLASS 362

29 6,039,451
31 6,039,452
101 6,039,453
116 6,039,454
142 6,039,455
189 6,039,456
217 6,039,457
249 6,039,458
253 6,039,459
267 6,039,460
287 6,039,461
410 6,039,462
414 6,039,463
477 6,039,464
496 6,039,465
515 6,039,466

CLASS 363

20 6,040,986
21 6,040,987
37 6,040,988
41 6,040,989
59 6,040,990

CLASS 364

479.01 6,039,467

CLASS 365

154 6,040,991
183 6,040,992
185.03 6,040,993
185.18 6,040,994
6,040,995
185.19 6,040,996
185.33 6,040,997
189.01 RE. 36,621
194 6,040,998
200 6,040,999
6,041,000
6,041,001
201 6,041,002
202 6,041,003
207 6,041,004
6,041,005
210 6,041,006
225.7 6,041,007
6,041,008
6,041,009
226 6,041,010
6,041,011
6,041,012
230.03 6,041,013
230.06 6,041,014
236 6,041,015
238.5 6,041,016

CLASS 366

41 6,039,468
97 6,039,469
137 6,039,470

CLASS 367

38 6,041,017
46 6,041,018
124 6,041,019
149 6,041,020

CLASS 368

64 6,041,021
6,041,022

CLASS 369

7 6,041,023
13 6,041,024
30 6,041,025
36 6,041,026
44.24 6,041,027
44.34 6,041,028
50 6,041,029
54 6,041,030
112 6,041,031
191 6,041,032
271 6,041,033

CLASS 370

203 6,041,034
217 6,041,035
222 6,041,036
228 6,041,037
229 6,041,038
230 6,041,039
232 6,041,040
241 6,041,041
245 6,041,042
254 6,041,043
6,041,044
313 6,041,045
319 6,041,046
347 6,041,047
349 6,041,048
351 6,041,049
352 6,041,050
6,041,051
360 6,041,052
389 6,041,053
6,041,054
391 6,041,055
395 6,041,056
397 6,041,057
401 6,041,058
412 6,041,059
6,041,060
461 6,041,061
465 6,041,062
6,041,063
466 6,041,064
492 6,041,065
512 6,041,066
514 6,041,067
538 6,041,068

CLASS 372

6 6,041,069
6,041,070
64 6,041,071
102 6,041,072

CLASS 374

43 6,039,471
117 6,039,472

CLASS 375

148 6,041,073
200 6,041,074
222 6,041,075
224 6,041,076
6,041,077
240 6,041,078
6,041,079
242 6,041,080
297 6,041,081
300 6,041,082
304 6,041,083
317 6,041,084
326 6,041,085
341 6,041,086
348 6,041,087
358 6,041,088
371 6,041,089
376 6,041,090

CLASS 376

327 6,041,091

CLASS 377

1 6,041,092
47 6,041,093

CLASS 378

37 6,041,094
45 6,041,095
48 6,041,096
62 6,041,097
70 6,041,098
85 6,041,099
141 6,041,100
147 6,041,101
165 6,041,102

CLASS 379

67.1 6,041,103
6,041,104
93.05 6,041,105
102.06 6,041,106
164 6,041,107
196 6,041,108
201 6,041,109
6,041,110
6,041,111
209 6,041,112
6,041,113
211 6,041,114
230 6,041,115

244 6,041,116
268 6,041,117
391 6,041,118
424 6,041,119
433 6,041,120
446 6,041,121

CLASS 380

21 6,041,122
49 6,041,123
270 6,041,124

CLASS 381

71.4 6,041,125
71.6 6,041,126
92 6,041,127
322 6,041,128
328 6,041,129
374 6,041,130
415 6,041,131

CLASS 382

100 6,041,132
124 6,041,133
126 6,041,134
132 6,041,135
162 6,041,136
185 6,041,137
197 6,041,138
199 6,041,139
209 6,041,140
231 6,041,141
232 6,041,142
6,041,143
239 6,041,144
268 6,041,145
274 6,041,146
305 6,041,147
308 6,041,148

CLASS 383

5 6,039,473
66 6,039,474

CLASS 384

580 6,039,475

CLASS 385

2 6,041,149
12 6,041,150
16 6,041,151
24 6,041,152
109 6,041,153
116 6,041,154
139 6,041,155
6,041,156
141 6,041,157

CLASS 386

1 6,041,158
46 6,041,159
94 6,041,160
112 6,041,161
124 6,041,162

CLASS 388

811 6,041,163

CLASS 392

407 6,041,164

CLASS 395

102 6,041,165
200.68 6,041,166
390 6,041,167
500.07 6,041,168
6,041,169
500.23 6,041,170
500.27 6,041,171
6,041,172
6,041,173
500.33 6,041,174
500.42 6,041,175
500.48 6,041,176
704 6,041,177
705 6,041,178
709 6,041,179
6,041,180
6,041,181
712 6,041,182
6,041,183

CLASS 396

51 6,041,184
56 6,041,185
80 6,041,186
132 6,041,187
178 6,041,188
277 6,041,189
284 6,041,190
311 6,041,191
315 6,041,192
379 6,041,193
418 6,039,476
429 6,041,194
6,041,195

CLASS 399

27 6,041,196
50 6,041,197
51 6,041,198
82 6,041,199
6,041,200
93 6,041,201
106 6,041,202
111 6,041,203
159 6,041,204
196 6,041,205
249 6,041,206
275 6,041,207
281 6,041,208
313 6,041,209
333 6,041,210
352 6,041,211
359 6,041,212
401 6,041,213
403 6,041,214

CLASS 400

236 6,039,477
472 6,039,478
621 6,039,479
662 6,039,480
708 6,039,481

CLASS 401

1 6,039,482
50 6,039,483
52 6,039,484
67 6,039,485
88 6,039,486
126 6,039,487
132 6,039,488
146 6,039,489
185 6,039,490
186 6,039,491
195 6,039,492
209 6,039,493

CLASS 402

73 6,039,494
79 6,039,495

CLASS 403

4 6,039,496
16 6,039,497
61 6,039,498
78 6,039,499
6,039,500
231 6,039,501
282 6,039,502

CLASS 404

67 6,039,503

CLASS 405

129 6,039,504
156 6,039,505
204 6,039,506
227 6,039,507
232 6,039,508
302.2 6,039,509

CLASS 406

21 6,039,510
46 6,039,511
85 6,039,512
171 6,039,513

CLASS 408

1 R 6,039,514
188 6,039,515

CLASS 409

134 6,039,516
135 6,039,517
218 6,039,518

CLASS 410

69 6,039,519
106 6,039,520
118 6,039,521
127 6,039,522

CLASS 411

21 RE. 36,622
48 6,039,523
149 6,039,524
353 6,039,525

CLASS 414

411 6,039,526
491 6,039,527
546 6,039,528
627 6,039,529
6,039,530

CLASS 415

115 6,039,531
119 6,039,532
146 6,039,533
162 6,039,534
172.1 6,039,535
216.1 6,039,536

CLASS 416

97 R 6,039,537
134 A 6,039,538
186 R 6,039,539
210 R 6,039,540
223 R 6,039,541
233 6,039,542

CLASS 417

12 6,039,543
53 6,039,544
6,039,545
61 6,039,546
234 6,039,547
313 6,039,548

CLASS 418

55.5 6,039,549
55.6 6,039,550
88 6,039,551
166 6,039,552

CLASS 420

422 6,039,918
446 6,039,919
590 6,039,920

CLASS 422

21 6,039,921
24 6,039,922
61 6,039,923
67 6,039,924
82.08 6,039,925
116 6,039,926
175 6,039,927
186.3 6,039,928

CLASS 423

328.2 6,039,929
592 6,039,930

CLASS 424

9.364 6,039,931
45 6,039,932
47 6,039,933
53 6,039,934
59 6,039,935
70.1 6,039,936
73 6,039,937
76.1 6,039,938
78.03 6,039,939
78.06 6,039,940
93.21 6,039,941
94.6 6,039,942
94.62 6,039,943
94.64 6,039,944
6,039,945
140.1 6,039,946
184.1 6,039,947
6,039,948
195.1 6,039,949
6,039,950
6,039,951
6,039,952
6,039,953
6,039,954
6,039,955
198.1 6,039,956
208.1 6,039,957
230.1 6,039,958
234.1 6,039,959
401 6,039,960
6,039,961
6,039,962
6,039,963
404 6,039,964
405 6,039,965
6,039,966
426 6,039,967
433 6,039,968
434 6,039,969
6,039,970
443 6,039,971
445 6,039,972
472 6,039,974
473 6,039,975
480 6,039,976
486 6,039,977
489 6,039,978
497 6,039,979
500 6,039,980
601 6,039,981

CLASS 425

115 6,039,553
130 6,039,554
362 6,039,555
363 6,039,556
429 6,039,557
556 6,039,558
574 6,039,559

CLASS 426

18 6,039,982
6,039,983
61 6,039,984
72 6,039,985
74 6,039,986
6,039,987
94 6,039,988
106 6,039,989
129 6,039,990
241 6,039,991
332 6,039,992
399 B1 994,291
496 6,039,993
498 6,039,994
518 6,039,995
534 6,039,996
549 6,039,997
605 6,039,998
633 6,039,999

CLASS 427

78 6,040,000
6,040,001
6,040,002
96 B1 411,760
156 6,040,003
177 6,040,004
185 6,040,005
197 6,040,006
209 6,040,007
215 6,040,008
226 6,040,009
241 6,040,010
250 6,040,011
255.28 6,040,012
255.391 6,040,013
281 6,040,014
358 6,040,015
407.1 6,040,016
421 6,040,017
496 6,040,018
510 6,040,019
526 6,040,020
557 6,040,021
576 RE. 36,623
579 6,040,022

CLASS 428

16 6,040,023
35.2 6,040,024
35.9 6,040,025
40.1 6,040,026
6,040,027
41.8 6,040,028
64.1 6,040,029
6,040,030
65.4 6,040,031
98 6,040,032
99 6,040,033
143 6,040,034
195 6,040,035
6,040,036
209 6,040,037
6,040,038
210 6,040,039
212 6,040,040
216 6,040,041
308.4 6,040,042
323 6,040,043
6,040,044
327 6,040,045
343 6,040,046
6,040,047
345 6,040,048
355 EN 6,040,049
364 6,040,050
367 6,040,051
408 6,040,052
412 6,040,053
413 6,040,054
428 6,040,055
432 6,040,056
453 6,040,057
457 6,040,058
469 6,040,059
478.2 6,040,060
480 6,040,061
500 6,040,062
532 6,040,063
593 6,040,064
614 6,040,065
641 6,040,066
647 6,040,067
688 6,040,068
690 6,040,069
700 6,040,070
704 6,040,071

CLASS 429

12 6,040,072
26 6,040,073
27 6,040,074
32 6,040,075
35 6,040,076
40 6,040,077
48 6,040,078
91 6,040,079
96 6,040,080
131 6,040,081
163 6,040,082
169 6,040,083
176 6,040,084
185 6,040,085
211 6,040,086
218.1 6,040,087
229 6,040,088
231.1 6,040,089
231.95 6,040,090
324 6,040,091
331 6,040,092

CLASS 430

5 6,040,093
6,040,094
6,040,095
6,040,096
28 6,040,097
59.6 6,040,098
66 6,040,099
72 6,040,100
108 6,040,101
6,040,102
110 6,040,103
6,040,104
127 6,040,105
6,040,106
165 6,040,107
200 6,040,108
204 6,040,109
258 6,040,110
270.1 6,040,111
6,040,112
270.13 RE. 36,624
271.1 6,040,113
296 6,040,114
303 6,040,115
306 6,040,116
311 6,040,117
328 6,040,118
330 6,040,119
347 6,040,120
419 6,040,121
461 6,040,122
463 6,040,123
496 6,040,124
506 6,040,125
557 6,040,126
567 6,040,127
569 6,040,128
604 6,040,129
617 6,040,130
619 6,040,131

CLASS 431

9 6,039,560
153 6,039,561
6,039,562
291 6,039,563

CLASS 433

17 6,039,564
29 6,039,565
60 6,039,566
88 6,039,567
175 6,039,568
180 6,039,569

CLASS 434

126 6,039,570
151 6,039,571
254 6,039,572
268 6,039,573
304 6,039,574
317 6,041,215
323 6,039,575
367 6,039,576

CLASS 435

2 6,040,132
4 6,040,133
6,040,134
6,040,135
5 6,040,136
6,040,137
6 6,040,138
6,040,139
6,040,140
6,040,141
6,040,142
6,040,143
6,040,144
7.2 6,040,145
7.23 6,040,146
7.24 6,040,147
7.32 6,040,148
15 6,040,149
28 6,040,150
6,040,151
29 6,040,152
30 6,040,153
42 6,040,154
69.1 6,040,155
6,040,156
69.4 6,040,157
89 6,040,158
91.31 6,040,159
115 6,040,160
134 6,040,161
183 6,040,162
6,040,163
189 6,040,164
193 6,040,165
194 6,040,166
235.1 6,040,167
6,040,168
236 6,040,169
252.3 6,040,170
288.1 6,040,171
320.1 6,040,172
6,040,173
325 6,040,174
6,040,175
326 6,040,176
372.3 6,040,177
375 6,040,178
6,040,179
377 6,040,180
6,040,181
395 6,040,182
457 6,040,183
461 6,040,184
468 6,040,185

CLASS 436

53 6,040,186
63 6,040,187
71 6,040,188
151 6,040,189
164 6,040,190
172 6,040,191
177 6,040,192
180 6,040,193
501 6,040,194
514 6,040,195
518 6,040,196
525 6,040,197

CLASS 437

237 6,039,577

CLASS 438

16 6,040,198
17 6,040,199
30 6,040,200
6,040,201
70 6,040,202
106 6,040,203
109 6,040,204
118 6,040,205
149 6,040,206
216 6,040,207
229 6,040,208
238 6,040,209
6,040,210
6,040,211
242 6,040,212
243 6,040,213
244 6,040,214
253 6,040,215
257 6,040,216
258 6,040,217
259 6,040,218
268 6,040,219
286 6,040,220
297 6,040,221
301 6,040,222
303 6,040,223
308 6,040,224
314 6,040,225
381 6,040,226
382 6,040,227
393 6,040,228
396 6,040,229
398 6,040,230
424 6,040,231
6,040,232
6,040,233
439 6,040,234
464 6,040,235
486 6,040,236
521 6,040,237
592 6,040,238
612 6,040,239
618 6,040,240
622 6,040,241
672 6,040,242
687 6,040,243
691 6,040,244
692 6,040,245
706 6,040,246
713 6,040,247
725 6,040,248
769 6,040,249

CLASS 439

54 6,039,578
56 6,039,579
63 6,039,580
74 6,039,581
76.1 6,039,582
101 6,039,583
115 6,039,584
137 6,039,585
157 6,039,586
159 6,039,587
164 6,039,588
188 6,039,589
247 6,039,590
265 6,039,591
271 6,039,592
280 6,039,593
318 6,039,594
377 6,039,595
404 6,039,596
441 6,039,597
451 6,039,598
489 6,039,599
496 6,039,600
500 6,039,601
550 6,039,602
587 6,039,603
598 6,039,604
610 6,039,605
6,039,606
622 6,039,607
651 6,039,608
668 6,039,609
682 6,039,610
701 6,039,611
716 6,039,612
718 6,039,613
843 6,039,614
849 6,039,615

874 6,039,616

CLASS 440

61 6,039,617
89 6,039,618

CLASS 442

61 6,040,250
123 6,040,251
169 6,040,252
239 6,040,253
261 6,040,254
382 6,040,255

CLASS 445

24 6,039,619
25 6,039,620
49 6,039,621
52 6,039,622
63 6,039,623
403 6,039,624

CLASS 446

83 6,039,625
175 6,039,626
208 6,039,627
457 6,039,628

CLASS 450

57 6,039,629

CLASS 451

6 6,039,630
37 6,039,631
41 6,039,632
6,039,633
49 6,039,634
72 6,039,635
178 6,039,636
271 6,039,637
288 6,039,638
356 6,039,639
460 6,039,640
540 6,039,641
557 6,039,642

CLASS 453

3 6,039,643
10 6,039,644
6,039,645

CLASS 454

365 6,039,646

CLASS 455

9 6,041,216
38.3 6,041,217
38.4 6,041,218
81 6,041,219
90 6,041,220
186.1 6,041,221
255 6,041,222
326 6,041,223
327 6,041,224
352 6,041,225
405 6,041,226
412 6,041,227
419 6,041,228
420 6,041,229
422 6,041,230
6,041,231
6,041,232
427 6,041,233
434 6,041,234
437 6,041,235
446 6,041,236
450 6,041,237
452 6,041,238
453 6,041,239
464 6,041,240
574 6,041,241
575 6,041,242
6,041,243
6,041,244

CLASS 460

114 6,039,647

CLASS 463

16 6,039,648
6,039,649
47 6,039,650

CLASS 464

98 6,039,651
147 6,039,652

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